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[H.N.S.C. No. 104–48]

ACCIDENT INVESTIGATIONS OF RECENT F–14 AND AV–8B MISHAPS

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Accident Investigations of Recent F...

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BEFORE THE

MILITARY PROCUREMENT SUBCOMMITTEE

OF THE

COMMITTEE ON NATIONAL SECURITY
HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTH CONGRESS

SECOND SESSION

HEARING HELD
APRIL 16, 1996

OCT 31 1997

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ACCIDENT INVESTIGATIONS OF RECENT F–14 AND AV–8B MISHAPS

House of Representatives,
Committee on National Security,
Military Procurement Subcommittee,
Washington, DC, Tuesday, April 16, 1996.

The subcommittee met, pursuant to notice, at 10:01 a.m., in room 2118, Rayburn House Office Building, Hon. Duncan Hunter (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. DUNCAN HUNTER, A REPRESENTATIVE FROM CALIFORNIA, CHAIRMAN, MILITARY PROCUREMENT SUBCOMMITTEE

Mr. Hunter. The subcommittee will come to order. This morning, we welcome Representative Bob Clement and witnesses from the Navy and the Marine Corps to discuss the recent F–14 and AV–8B mishaps.

As my colleagues are aware, three F–14's and three AV–8B's have crashed since the beginning of the year. Several of these involve fatalities. In the case of the F–14 crash in Nashville, three civilians were also killed. We owe it to our service personnel, their families, and the families of those who died in the residential Nashville neighborhood to examine carefully the causes of these recent accidents. The safety record of these aircraft and whether or not this subcommittee needs to take any action to improve Navy and/or Marine Corps aviation safety is also at issue.

Throughout this subcommittee's hearings on the administration's fiscal year 1997 defense budget request, I have expressed my concern that the services' modernization accounts are being used as bill payers for shortages in two areas, personnel and readiness. We must ask if there are things the services could have done to improve the safety of these aircraft but were unable to do because of a lack of modernization resources. As some have reported, are the services in the difficult position of having to choose between combat upgrades or safety improvements?

In addition, of concern to me is whether the increase in op tempo has played any part in these accidents. There have been reports that Carrier Air Wing 2, a Miramar-based unit to which one of the three F–14's that crashed was assigned, has experienced a higher op tempo than usual. The air wing recently completed a 6-month deployment aboard the *Lincoln* in October 1995 and is preparing for another deployment in October of this year. Typically, an air wing has 18 months between deployments. With only five air wings available to support six carriers in the Pacific fleet, we must question whether we are not asking too much of our service personnel and what impact it is having on safety matters across the board.

In order to help us better understand and come to grips with these issues, the subcommittee is pleased to have with us today two senior aviators from the Navy Department, Adm. Jay L. Johnson, Vice Chief of Naval Operations, and Admiral Johnson, thank you for being with us, and Lt. Gen. Harold W. Blot, Deputy Chief of Staff for Aviation, headquarters, U.S. Marine Corps. General Blot, thank you for being with us this morning.

As I mentioned earlier, we also have with us a very distinguished Representative and good friend, Bob Clement from Tennessee, whose district includes the site of the Nashville tragedy. Congressman Clement, thank you for being with us this morning.

We welcome all of you and we are going to start out with Representative Clement. But before we start, let me just say we also have joining our subcommittee today my seatmate from San Diego and the top gun, Duke Cunningham, who is very, very concerned also about the issue of aviation safety and who has done a lot of work and a lot of analysis and research on the tragedies that we are going to be discussing. Duke, thank you for being with us.

We also have with us the distinguished ranking member of the full committee, Mr. Dellums. He has to leave to swear in a new Member from California at about 11 o'clock, but thank you, Mr. Dellums, for being with us this morning.

Before we proceed with our first witness, let me welcome my friend, the very distinguished gentleman from Missouri, Mr. Skelton. Ike, do you have any comments you would like to make?

STATEMENT OF IKE SKELTON, A REPRESENTATIVE FROM MISSOURI

Mr. SKELTON. Thank you very much, Mr. Chairman. I thank you for holding this hearing today. I welcome the opportunity to briefly review the safety of our Nation's naval and maritime aviation units in this forum this morning.

It is with a heavy heart, Mr. Chairman, that I sit here. Knowing that recent tragedies have taken the lives of fellow Americans is disturbing. I have always felt that if we lose just one airman during operations, it is one too many. My condolences to the families of the deceased, both military and civilian. Let us all hope our meeting today will help save a life tomorrow.

Admiral Johnson, Lieutenant General Blot, thank you for joining us and assisting in our effort. We look forward to your testimony a bit later.

Mr. Chairman, last May, I became concerned about a series of fatal military aircraft crashes, 18 deaths in five crashes in less than 5 weeks. These include the C–21 crash in Alabama that killed eight, one fatality in an F–117 crash in New Mexico, six deaths in a C–130 crash in Idaho, two deaths in a Navy F–18 crash in New Mexico, and one death in an A–10 crash in Texas. It seemed to me that we were seeing higher numbers of crashes and deaths than in recent years.

On May 26, 1995, I asked the General Accounting Office [GAO], to review class A mishaps over the last 20 years. I felt it important to focus on those accidents involving a Department of Defense aircraft that results in damages totaling $1 million or more, a destroyed aircraft, a fatality, or a permanent total disability. Regrettably, in 1996, several more class A mishaps occurred in Nashville, California, and North Carolina.

I asked the General Accounting Office to, No. 1, look at historical trends to learn if the number of accidents were increasing; No. 2, to review the accident investigation process of the Army and the Navy and the Air Force; and No. 3, review actions taken to reduce the number of accidents. I wanted to determine if there was a common thread in these incidents that would help prevent future such accidents.

Mr. Chairman, I ask at this point for the inclusion of the GAO report in its entirety, as I briefly summarize its findings.

Mr. HUNTER. Without objection.

[To obtain a copy of the GAO report, please contact the General Accounting Office, Washington, DC. Titled: Military Aircraft Safety, Significant Improvements Since 1975. GAO/NSIAD–96–69BR]

[The prepared statement of Mr. Skelton follows:]

CONGRESSMAN IKE SKELTON
OPENING STATEMENT
HOUSE NATIONAL SECURITY SUBCOMMITTEE ON MILITARY PROCUREMENT
April 16, 1996

Mr. Chairman, thank you for holding this hearing today. I welcome the opportunity to briefly review safety of our nation's naval and marine aviation units in this forum.

It is with a heavy heart that I sit here; knowing that recent tragedies have taken the lives of fellow Americans is disturbing. I have always felt that if we lose just one airman during operations, it is one-too-many. My condolences to the families of the deceased, both military and civilian. Let us all hope our meeting today will help save a life tomorrow.

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On May 26, 1995, I asked the General Accounting Office (GAO) to review "Class A" mishaps over the last 20 years. I felt it important to focus on those accidents involving a Department of Defense aircraft that results in damages totalling $1 million or more, a destroyed aircraft, a fatality, or a permanent total disability. Regrettably, in 1996, several more "Class A" mishaps occurred, in Nashville, California, and North Carolina.

I asked GAO to (1) look at historical trends, to learn if the number of accidents were increasing; (2) review the accident investigation process in the Army, Navy and Air Force; and (3) review actions taken to reduce the number of accidents. I wanted to determine if there was a common thread in these incidents that would help prevent future accidents.

Mr. Chairman, I ask for the inclusion of the report in the record, in its entirety, as I briefly summarize its findings.

The report revealed two surprises. First, there has actually been a decline in the number of crashes since 1975; (In

1995, 76 accidents occurred, down from 309 in 1975.) and second, that human error was a contributing factor in 73 percent of the mishaps in 1994 and 1995. Even when equipment malfunction contributed to the cause of a crash, human error -- either by pilots or ground crew -- was also a factor.

I am anxious to listen to the testimony today. The Navy's complete investigation of the Nashville, TN, incident should be revealing. I am particularly interested in any similarities in the findings of the U.S. Navy and those of GAO. Any -- and all -- problems should be addressed in the congressional authorization process.

Thank you.

Mr. SKELTON. The report revealed two surprises. First, there has actually been a decline in the number of crashes since 1975. These are class A mishaps. In 1995, 76 accidents occurred, down from 309 in 1975.

Second, human error was a contributing factor in 73 percent of the mishaps in 1994 and 1995. Even when equipment malfunction contributed to the cause of the crash, human error, Mr. Chairman, either by pilots or ground crew, was also a factor.

I am anxious to listen to the testimony today. The Navy's complete investigation of the Nashville, TN, incident should be revealing and I am particularly interested in any similarities in the findings of the U.S. Navy and those of the General Accounting Office. Any and all problems should be addressed in the congressional authorization process, and that is what we are doing.

I really think, Mr. Chairman, you are to be commended for calling this hearing and we especially appreciate Congressman Bob Clement and his interest in this very, very important but tragic event.

Mr. HUNTER. I thank the distinguished gentleman.

Congressman Clement, the floor is yours.

STATEMENT OF HON. BOB CLEMENT, A REPRESENTATIVE FROM TENNESSEE

Mr. CLEMENT. Mr. Chairman, thank you very much. It is a pleasure to have the opportunity to testify and I want to thank you in particular and Mr. Skelton. When I contacted you concerning what happened in Nashville, you wasted no time in setting this hearing for today. Thanks to all the members of this great committee and the Subcommittee on Military Procurement.

As you know, on the morning of January 29, a Navy F–14 crashed into a residential neighborhood shortly after taking off from Nashville International Airport, killing two pilots on board and taking the lives of three civilian Nashville residents.

Given the highly publicized engine problems of the U.S. Navy's aging F–14 fleet, there was speculation that engine complications may have been a factor in the crash. However, after a 2-month investigation, the Navy has concluded that the direct cause of the mishap was pilot error.

I congratulate the Navy for its prompt investigation and subsequent release of its report, but I am disturbed by the findings. Serious questions have been raised about the preparedness of our fighter pilots as well as the airworthiness of the F–14A aircraft.

The accident in Nashville is a terrible tragedy, and the people in the affected area are still suffering from the aftershocks. The families of those individuals involved in the crash have suffered enough. However, it would be doubly tragic if the U.S. Navy were to forget the lessons that have been learned from this investigation.

As this committee looks at the safety record of the Navy F–14 fleet today, I urge members to review closely both sides of the equation, human factors as well as the technical equipment. While the Judge Advocate General's report on the January 29 crash in Nashville found that pilot error was the cause. What about the February 18 crash of the F–14 off the coast of southern California which killed both crewmen? What about the February 22 crash of an F–14 in the Persian Gulf which killed both crewmen?

Since 1991, there have been a total of 32 crashes involving the F–14 aircraft. At approximately $35 million per plane and the human consequences that result from tragedies like the Nashville crash, we cannot afford to continue flying this aircraft unless we find out what is causing these accidents.

Is it poor training? Is it poor maintenance on the aircraft? Are the engine failures too high on the F–14 as compared to other similar aircraft? Is the Navy placing too much emphasis on funding combat upgrades rather than safety upgrades for the F–14? Is the F–14 an inherently unstable aircraft? Could these accidents have been prevented?

These are tough questions. Nobody likes to ask them, but we have a duty to assess the aircraft and the Navy's policies to see if a common thread exists among these recent accidents.

I know some will argue that the F–14A is a fine aircraft and should not be phased out sooner than already scheduled. If that is the case, and it certainly may be, then the incident in Nashville reminds us that without proper training, preparation, and oversight, even the most advanced equipment can be of no consequence.

I read the Judge Advocate General's report on the F–14 Nashville crash and I was astounded when I read the glaring omissions by individuals in senior positions who are responsible for evaluating our fighting force. The Navy responded to the crash by removing the squadron's commanding officer, but the issues of command environment, safety training, and decisions addressed in this investigation cannot be solved by the dismissal of a commanding officer or an acknowledgement of a pilot fault.

There are deeper issues that may be systemic to the F–14 program, issues like a lack of clear communication between levels of command, questionable credentials, and criteria of the Navy pilot program, and a need for improved oversight of the planning and execution of training flights. That must be addressed by the Navy in order to prevent a tragedy like this one from occurring in the future.

For example, how soon should pilots be restored to normal flight duty after losing an aircraft? What system does the Navy have in place when pilots and other officers want to report unsafe flying events of other pilots? Does that system work? How are in-flight incidents reported and investigated by those in command? Is that system working as it should? Should a squadron's safety officer graduate from aviation safety school before taking command?

Mr. Chairman, these questions beg another and perhaps more important question. Is the event of January 29 in Nashville an unfortunate occurrence which the Navy can address as some isolated incident or is it the result of a more complex systemic problem?

The Navy may see the tragedy in Nashville as a blip on the radar screen, given that no mechanical failure of the aircraft was discovered. Nevertheless, this hearing and these questions are very important to the people of Nashville and the entire country. We need to know if the cause was an isolated event or part of a larger pattern.

In closing, in May, the Transportation and Infrastructure Committee, of which I am a member, will also hold hearings addressing other issues surrounding the crash. For example, the committee will explore how the military communicates with the air traffic controllers when taking off and landing at civilian airports located in densely-populated areas. We have a duty as Members of Congress to continue to press the Navy to respond to these accidents and act expeditiously to prevent any further crashes.

I would like to express my deepest sympathies to the families of Elmer and Ada Newsom, Ewing Wair, Navy Lt. Cmdr. Stacy Bates, and radio intercept officer Lt. Graham Higgins. It is in their memory that I will work with the military and the Federal Aviation Administration to be sure tragedies like this one do not happen again.

I am a veteran myself. I am proud to be a veteran. I am proud of the Navy. I realize we have problems at times, but we have to face up to those problems. I want to congratulate the Navy that after the fact, they were right there on the spot. They did everything they humanly could have done to be a good neighbor, to be a good friend, and try to offer some real assistance to those that have truly been suffering.

I know the comment has been made in Nashville when I met with the Navy, yes, we have made great strides when it comes to advanced technological equipment, but maybe we have not made as many great strides when it comes to the human factor, because a lot of these incidents that the Navy has been pointing out have been human error rather than advanced technological equipment failures.

Is that true or is that not true? That is up to this committee. That is up to the U.S. Congress. That is up to the Navy, because the Navy investigates their various accidents. It is not the National Transportation Safety Board.

So the Navy has a lot of responsibility on their shoulders, knowing that they have made a major commitment, a major financial commitment to the F–14 program and realizing that the F–14A program is being phased out by the year 2004, but maybe it should be phased out even sooner than that.

Thank you, Mr. Chairman.

Mr. HUNTER. To our distinguished colleague, thank you for being with us. We know this is of great concern to you and we appreciate your very thoughtful statement.

Admiral Johnson.

STATEMENTS OF A PANEL CONSISTING OF ADM. JAY L. JOHNSON, VICE CHIEF OF NAVAL OPERATIONS, U.S. NAVY; ACCOMPANIED BY REAR ADM. JEFFREY COOK, PROGRAM EXECUTIVE OFFICER, TACTICAL AIRCRAFT PROGRAMS, U.S. NAVY, AND CAPT. DALE SNODGRASS, COMMANDER, FIGHTER WING, U.S. ATLANTIC, U.S. NAVY; AND LT. GEN. HAROLD W. BLOT, DEPUTY CHIEF OF STAFF FOR AVIATION, U.S. MARINE CORPS

Admiral JOHNSON. Mr. Chairman, thank you, sir, for asking us to appear before your subcommittee this morning. I appreciate the opportunity to share with you and others what the Navy has done, and really, more importantly, what we intend to do to keep Naval aviation safe and combat ready.

As you know, Naval aviation is a demanding and at times very unforgiving profession. Day and night, our aviators and our deck crews perform extraordinary feats in defense of our country. We have much to be proud of in this performance. They are a remarkable and dedicated group who deserve nothing less than the best and safest equipment we can give them.

The GAO review directed by Mr. Skelton previously mentioned did conclude that Department of Defense [DOD] aviation safety has improved significantly over the last 21 years. This positive trend applies to the F–14, as well. However, because of the three F–14 mishaps over a 4-week period and because one life lost is too many, we have taken an even closer look at the F–14 community.

Following these mishaps, the Chief of Naval Operations [CNO] ordered a safety standdown to take the time to review what was known and determine if there were any operational restrictions that needed to be placed on the Tomcat. In fact, at the recommendation of a team of government and industry experts, we did indeed place interim restrictions on the F–14 in the low-altitude, high-speed environment.

This was a prudent approach and consistent with the basic principles of aviation safety. If there is an undetected mechanical weakness or some other underlying problem in maintenance and training, our investigations will identify the problem and we will immediately apply the appropriate remedies.

Additional steps were taken during the month of March. As a result of new information gained from the salvage of the F–14D off the coast of southern California, afterburner use is now prohibited for F–14B's and D's at all altitudes except for emergency situations. We will reassess these restrictions when the full results of the investigations are known. These restrictions reduce F–14 aircraft operations in a regime where there is very little margin for error, but they will not degrade F–14 training and readiness in the near term.

The CNO also asked the fleet commanders to review procedures and ensure that safety is given top priority. Additionally, we have directed that operational risk management be a key factor in the planning and execution of all aviation training and operations.

Investigations into the three F–14 mishaps have also been underway during the period, and at this point, we still do not believe there is a common thread. I will give you a quick update on these.

The completed report, as previously mentioned, on the Nashville F–14A mishap, portions of which were released last Friday, confirm our earlier belief that, indeed, pilot error was the primary cause, as Mr. Clement mentioned. Simply put, we believe the pilot lost control due to vertigo as a result of an unrestricted climb into a 2,300-foot overcast. We did not find any mechanical problems with the aircraft or with its TF30 engines.

I would like to emphasize here that while pilot error was a principal cause of this mishap, there are other issues that need to be addressed and corrected and we can talk to those later. Over the next few months, we will carefully dissect this rather massive report and I can assure you we will evaluate and correct every known problem to prevent a similar occurrence in the future.

The other F–14A mishap, the third in the series, also was a result of pilot error, with the pilot losing control of the aircraft after improperly performing a negative G maneuver during a post-maintenance functional check flight. A decision to salvage this aircraft has been made at the request of the Mishap Board to make sure that we know whether there are any other possible factors that might have somehow contributed to the mishap. Despite the fact that we believe we understand the primary factors that contributed to this mishap, the CNO wanted to ensure that we have left no stone unturned in our investigation.

The second mishap in the series, the F–14D off the coast of southern California, the board's finding is still pending. We expect it within the next 2 weeks. It is pending the results of the engineering investigation of the aircraft and engines, with primary focus on the engines. As I mentioned, it should be complete by about April 20, we anticipate, and that will allow the mishap board to submit its findings soon thereafter.

I can only tell you at this point that in the investigation, the problem appears to be centered around the afterburner, and while we have not fully determined what went wrong, we have learned enough to feel confident that our recently revised restrictions on the F–14B's and D's, which now completely prohibit afterburner use except in emergencies, will prevent a similar mishap. We will continue, however, to pinpoint the root cause and implement corrective action for this problem with the F110 engine.

The causes of aircraft mishaps are varied and complex. Sometimes we find human error. Sometimes we find mechanical problems. Often, it is a combination of both. And sometimes, despite everyone's best efforts, the cause remains undetermined. In the final analysis, the strength of our mishap investigation process lies in our ability to learn from these mishaps and apply those lessons to the way we operate and maintain our aircraft and train our crews. In these most recent accidents, however, we feel confident that we will have specific causal factors for each one.

A number of other initiatives in the area of F–14 safety are also underway. We are reviewing how we conduct flight operations for mission and proficiency training. This is part of a continuing process. With the addition of the precision strike mission for F–14 air crews, there has been a shift in the emphasis of training. Flight hours are now devoted to air-to-ground as well as air-to-air training. While this shift has not produced any apparent decrease in readiness, we are closely monitoring the effect on mission proficiency. The air-to-ground mission is vital and we must be able to conduct it safely and effectively. I want you to know we are looking at this closely as we do an entire review of the F–14 training program.

Efforts have also been underway for some time to address the material readiness of the Tomcat. This is part of the continuous readiness review process that looks at all aspects of Naval aviation. While the F–14 continues to meet current operational commitments, we have been working hard to improve those aircraft systems which are the highest readiness degraders, the radar transmitter, the inertial navigation system, and the radar antennae. The service life and health of the F–14 is monitored closely and we are funding over $350 million in structural life and safety modifications and $650 million in operational and logistic enhancements over the future year defense plan [FYDP].

Over the past several years, we have looked at many different ways to improve the F–14A. We made the decision not to upgrade the engines because they would be too expensive to put in an aircraft which would be removed from service a few years after being re-engined.

Through extensive in-service engineering analysis, we are installing a low-cost but very effective means of alerting air crews of impending catastrophic TF30 engine failure. This cockpit warning light will alert the air crew to a sudden rise in engine breather pressure, which is an indication of impending engine failure, in time to reduce power and safely land the aircraft. This new system will greatly increase air crew awareness and further contribute to safe F–14A operations. We will begin installation of this warning light this November at a rate of 15 a month and the installation will be complete by September of 1997.

Also, the Navy will incorporate the GEC Marconi digital flight control system into all F–14 aircraft to significantly improve flight safety. This modification will affect 211 active duty and 16 Reserve F–14 aircraft. The recently completed foreign comparative test has shown that DFCS drastically decreases the chance of entering out-of-control flight and improves the Tomcat's ability to recover if it ever does enter a spin.

Departure from controlled flight has been a primary causal factor in 35 F–14 mishaps, but also significant is its ability to improve carrier approach line-up control, addressing a problem often cited as a contributing factor in carrier landing mishaps. The incorporation of digital flight control system will increase safety both during edge-of-the-envelope maneuvering flight and carrier landings. Installation will begin in June of 1998 and complete in June of 1999.

As you know, we intend to begin retiring F–14A's in fiscal year 2001, to be fully out of the inventory by 2004. These squadrons will transition to the F/A–18F Super Hornet, and this is in line with our overall plan to reduce the age of our fleet aircraft by aggressively retiring, when possible, our oldest aircraft.

Mr. Chairman, I assure you we are on top of this issue and that we have a good plan for the F–14 community now and in the future. It is balanced and it takes into consideration both the safety and the combat readiness of our people and our equipment. Thank you very much, sir.

[The prepared statement of Admiral Johnson follows:]

NOT FOR PUBLICATION UNTIL
RELEASED BY THE HOUSE
NATIONAL SECURITY COMMITTEE

STATEMENT OF
ADMIRAL JAY L. JOHNSON, U.S. NAVY
VICE CHIEF OF NAVAL OPERATIONS
BEFORE THE
PROCUREMENT SUBCOMMITTEE
OF THE
HOUSE NATIONAL SECURITY COMMITTEE
ON
16 APRIL 1996
F-14 SAFETY RECORD

NOT FOR PUBLICATION UNTIL
RELEASED BY THE HOUSE NATIONAL
SECURITY COMMITTEE

ADMIRAL JAY L. JOHNSON
UNITED STATES NAVY

Vice Chief of Naval Operations

A native of West Salem, Wisconsin, Admiral Johnson is a 1968 graduate of the United States Naval Academy. Upon completion of flight training, he was designated a Naval Aviator in 1969.

His first sea duty tour was aboard USS ORISKANY where he made two combat cruises flying the F8J CRUSADER with VF-191. Subsequent squadron and sea duty tours after transitioning to the F-14 TOMCAT included: VF-142, VF-101, Commanding Officer of VF-84; Commander, Carrier Air Wing ONE; Assistant Chief of Staff for Operations for Commander, SIXTH Fleet; and Commander, Carrier Air Wing ONE as Senior Air Wing Commander.

Shore duty assignments included: Aviation Junior Officer Detailer; Armed Forces Staff College; Head, Aviation Junior Officer Assignment Branch; and the Chief of Naval Operations Strategic Studies Group.

His first Flag Officer assignment was as Assistant Chief of Naval Personnel for Distribution in the Bureau of Naval Personnel. In October 1992, he reported as Commander, Carrier Group EIGHT/Commander, THEODORE ROOSEVELT Battle Group. In July 1994, he was assigned as Commander, SECOND Fleet/Commander, Striking Fleet Atlantic/Commander, Joint Task Force 120.

In March 1996, he reported for duty as the 28th Vice Chief of Naval Operations in Washington, D.C.

Admiral Johnson's decorations include the Defense Distinguished Service Medal, Defense Superior Service Medal, Legion of Merit (4 awards), Defense Meritorious Service Medal, Meritorious Service Medal, Air Medal (8 awards), Navy Commendation Medal and various service and campaign awards.

He is married to the former Garland Hawthorne of Colorado Springs, Colorado. Their daughter Cullen is a graduate of Longwood College.

ORAL STATEMENT OF ADMIRAL JAY L. JOHNSON

VICE CHIEF OF NAVAL OPERATIONS

THE F-14 PROGRAM: PRESENT AND FUTURE

Mr. Chairman, thank you for asking me to appear before your committee this afternoon.

Our greatest responsibility is to take good care of our hard-working men and women. And when it comes to their safety, we leave no stone unturned to ensure they live and work with safe and reliable equipment. That's why this hearing is important. I appreciate this opportunity to share with you what the Navy has done -- and what we intend to do -- in order to keep our fine people safe and combat ready.

As you know, Naval aviation is a demanding and at times an unforgiving profession. Day and night our aviators and deck crews are performing extraordinary feats in defense of our country. I have never been more proud of our aviation professionals than I am right now. They are a remarkable group. And this alone is reason enough to take a long, detailed look at why we have had an increase in the F-14 mishap rate over the past few years. The loss of three aircraft over a four week period earlier this year -- and the tragic loss of life -- make this effort even more important.

The CNO ordered a safety stand down in February to take the time to review what was known in order to find out if there were any operational restrictions that needed to be placed on the aircraft. This was a prudent approach and consistent with the basic principles of aviation safety. If there is an undetected mechanical weakness, or some other underlying problem in maintenance or training, our investigations will identify the problem, and we will immediately apply the appropriate remedies.

Additional steps were taken during the month of March. First, the Navy placed interim restrictions on the F-14 in the low altitude, high speed environment. As a result of new information gained from the salvage of the F-14D off the coast of southern California, afterburner use is now prohibited for F-14B's and F-14D's at all altitudes except for operational emergencies. We will reassess these restrictions when the full results of our investigation on the last three F-14 mishaps are known. These restrictions reduce F-14 aircraft operations in a regime where there is little margin for error; but they will not degrade F-14 training and readiness in the near term. The CNO also asked the fleet commanders to review procedures and ensure that safety is given top priority. Additionally, we have directed that operational risk management be a key factor in the planning and execution of all aviation training and operations.

Our mishap investigations into the three F-14 accidents have also been underway during this period and, at this point, there is no common thread evident.

To give you a quick update, the mishap report of the Nashville accident confirms our earlier belief that it was pilot error. Simply, the pilot lost control of the aircraft because of vertigo experienced as a result of an unrestricted climb into the clouds. We did not find any mechanical problems with the aircraft or its TF30 engines. The other F-14A, the third mishap in the series, also was a result of pilot error with the pilot losing control of the aircraft after improperly performing a negative G maneuver during a post-maintenance Functional Check Flight. A decision of whether salvaging this aircraft would substantially contribute to the Mishap Board's finding is currently pending. In the second mishap of the series, this one an F-14D, the Board's finding is on hold pending the engineering investigation of the aircraft and engines with primary focus on the engines. The engineering investigations should be essentially complete by 20 April allowing the Mishap Board to submit their findings shortly thereafter.

The causes of aircraft mishaps are varied and complex. Sometimes we find human error. Sometimes we find mechanical problems. Often it's a combination of both. And sometimes, despite our best efforts, the cause remains undetermined. In the final analysis, the strength of our mishap investigation process lies in our ability to learn from these mishaps; and apply those lessons to the way we operate and maintain our aircraft.

A number of other initiatives in the area of F-14 safety are also underway. We are reviewing how we conduct flight operations for mission and proficiency training. This is part of a continuing process. With the addition of the precision strike mission for F-14 aircrews, there has been a shift in the emphasis of training; flight hours now have to be devoted to air-to-ground training as well as for air-to-air training. While this shift has not produced any apparent decrease in readiness, we are closely monitoring the effect on mission proficiency. The air-to-ground mission is vital and we must be able to conduct the mission effectively and safely. I want you to know we are looking at this closely, as we do an entire review of the F-14 flight training program.

Efforts have also been underway for some time to address the material readiness of the F-14. This is part of a continuous readiness review process that looks at all aspects of Naval Aviation. While the F-14 continues to meet current operational commitments, we have been working hard to improve those aircraft systems which are the highest readiness degraders; which include the radar transmitter, inertial navigation system, and radar antenna. The service life and health of the F-14 is monitored closely, and we are funding over $350M in structural safety modifications and $650M in operational and logistical enhancements over the FYDP.

Over the past several years we have looked at many different ways to improve the F-14A. We made the decision not to upgrade the engines because they would be too expensive to put in an aircraft which would be removed from service a few years after being re-engined. Through extensive in-service engineering analysis, we are installing a low cost, but very effective means of alerting aircrew of impending catastrophic TF30 engine failure. This cockpit warning light will alert the aircrew to a sudden rise in engine breather pressure [an indication of impending engine failure] in time to reduce engine power and safely land the aircraft. This new system will greatly increase aircrew awareness and further contribute to safe F-14A operations.

Also, the Navy has decided to incorporate the GEC Marconi Digital Flight Control System (DFCS) into all F-14 aircraft to significantly improve flight safety. This modification will affect 211 active duty and 16 reserve F-14 aircraft. The recently completed Foreign Comparative Test (FCT) has shown that DFCS drastically decreases the chance of entering out-of-control flight and improves the F-14's ability to recover, if a spin is entered. Departure from controlled flight has been a primary causal factor in 35 F-14 mishaps. Also significant is its ability to improve carrier approach line-up control addressing a problem often cited as a contributing factor in carrier landing mishaps.

The incorporation of DFCS will increase safety, both during "edge-of-the-envelope" maneuvering flight and carrier landings.

As you know, we intend to begin retirement of the F-14A's in FY2001 to be fully out of the inventory by FY2004. These squadrons will transition to the F/A-18F Super Hornet. The transition plan was developed last summer as part of our ongoing efforts to reduce the age of fleet aircraft. This is in line with our overall plan to reduce the age of all of our fleet aircraft by aggressively retiring, when possible, our oldest aircraft.

Mr. Chairman, I assure you that we are on top of this issue and that we have a good plan for the F-14 community, now and in the future. It's balanced and takes into consideration both the safety and combat readiness of our people and equipment.

Again, thank you for this opportunity.

Mr. HUNTER. Thank you, Admiral Johnson. We will get into the details of the three mishaps and previous mishaps after a statement by General Blot. I understand you have several other witnesses who have been very close to this analysis process and they will be coming forth.

Admiral JOHNSON. Yes, sir, I have.

Mr. HUNTER. In fact, why do you not bring them up to the witness table while General Blot is testifying.

Admiral JOHNSON. All right, sir.

Mr. HUNTER. General Blot, thank you for being here. Unfortunately, in the same time period, we had three AV–8B mishaps and thought it was necessary because of that to have Marine Corps participation in this hearing. Thank you for being with us. The floor is yours.

General BLOT. Mr. Chairman, it is a pleasure to be here before the committee today to explain the AV–8B. I have submitted my testimony for the record, but I would like to take a few minutes to describe the AV–8B, since it is a unique airplane and has a unique control system, and that leads into the safety discussion that we are going to have.

I will put some slides up here. The first picture will be of an AV–8A. The AV–8A was the original airplane that we introduced into the U.S. Marine Corps in 1971. The thing that is different about the airplane is that it has the ability to go from conventional flight, where aerodynamic controls are providing the control to the pilot, to vertical flight, where there is a reactor control system.

The area in between, for example, when the pilot slows down, as he reduces speed below about 125 knots, the forces that are generated by the wing that are normally the dominant forces on the airplane are reduced to where other forces that are on every other airplane start to come into play. The control system was such that between 125 knots and 30 knots was an area that there was very little margin for error. If the nose went out of wind, actually by 15 degrees, it could exceed the control power that the pilot had to stop the airplane from rolling over. That was a very bad area. It was understood at that time and we determined that something had to be done about that.

The second piece, then, was the engine, and when you got into vertical flight, the engine was literally holding you in the air. That stressed the engine and put it at very high power settings. There was also a control problem on the engine in that the airplane weighed very close to what the engine was putting out in thrust. So the ability of the pilot to stop a rate of descent was not what we were used to in vertical airplanes, like helicopters. So they were two problems that we wanted to work on. Both had safety implications, and we had a high accident rate in the VSTOL regime.

The AV–8B airplane came along and replaced the AV–8A. When it did, it had a different wing design to it. That wing literally flew down to 35 knots. So the area that was of concern for stability and control between 30 knots and 125 knots was now reduced to 30 to 35 knots, a very small area you go through, and literally, the stability and control problem in vertical short takeoff and landing [VSTOL] of this airplane went away. We still had one extra control in there that the pilot had to use and that was to control his thrust, his vector, so that he could transition from conventional flight to vertical flight. That took care of that problem.

However, we used essentially the same engine and that engine was being stressed again to hold the airplane in the air. Although we made improvements to it as we went along, it still was right up against the edge and we have had some reliability problems with that engine.

The next airplane that comes along is what we are calling our remanufacturing program [REMAN] airplane. We have made some operational changes to it that resulted from Desert Storm, where we determined that we had to go higher to release our weapons, we had to fly at night. We removed the angle-rate bombing system and replaced it with the F–18 radar so we could get ranging on it, but we also introduced a 408 engine, which is the next version of the engine, considerably more powerful and more reliable than the earlier engine.

So those are the steps that we have taken as we have gone from 1971 to today. As I go through, I will talk about what effect that has had.

This is a look at our accident rate. We thought with the introduction of the AV–8B that we were going to get significantly better. We were. We were tracking. It was doing what we thought it was going to do. Then 1990 came along and we had a rash of accidents. We had 12 accidents in 1990. That alarmed everybody. We then stopped and said, OK, let us take a look at it. In the community itself, we took almost everybody that was involved in the Harrier and had a symposium and from that symposium we determined what had to be done to bring the accident rate down.

If you look at the slide on the far right-hand side, you will see a dotted line which is the projected rate if we go back to normal attrition rates that we would expect with this airplane, which shows we are still in the box. As Mr. Skelton brought up earlier, you would think that we were getting worse; we are not getting worse. However, if we continue the way we did in the first half of this year, then we will be back at rates that we have not experienced for several years.

The results of the safety symposium had several things that have already been mentioned here, the first of which caught us by surprise and that is the bulk of the pilot error accidents were happening in a VSTOL regime and they were happening with brand new pilots. Three out of four of the accidents were happening with people straight out of the replacement squadron. That indicated to us that we had a training problem. The second indication was that the engine was over half of our material failures and that we had to do something about that.

The actions that we took from that VSTOL symposium was we went back and we looked at our training syllabus and our training system. We changed the entrance criteria to get into the fleet replacement squadron [FRS], in fact, raised it so that you had to have higher grades coming out of the training command to qualify for Harriers.

We looked at how we were training pilots and we found out that even though the Harrier has about five times the landing combinations and takeoff combinations that normal airplanes have, we were devoting less sorties to it than conventional airplanes were. We then went back and changed that syllabus so now it reflects truly what was happening in the fleet.

We looked at our air groups and said, were you using the same procedures? When the pilots left the training squadron and joined the fleet squadrons, were they using the same procedures for these takeoffs and landings, and we found, in fact, that they had introduced their own local ways of doing things. We changed that. The groups now use the same standard operating procedures across the line.

The last part was the material improvement. That was something that was a little bit out of our control and based on financial constraints and it had to compete for those things that happened along the line.

We took a look at where we were, and the high bar to the left said, this is the airplane, the day attack airplane, the AV–8B that came out without the new engine in it. What would happen if we installed a new engine? That is the middle bar. Then what would happen if we could remake the airplane and install all those other things that we have learned have contributed to earlier accidents, and that is called the REMAN program, which is ongoing right now. So we felt that if we could accomplish that, we would bring this airplane right back in the middle of the pack of other airplanes.

The one thing that the middle bar did not address, though, was the fact that when we go to the new engine, it goes from 21,000 pounds of thrust to 24,000 pounds of thrust. That sounds like a little change. However, when you think that when a pilot comes in to land, he is normally within about 1,000 pounds of that margin. So that is all he has, is 1,000 pounds to break his rate of descent. You put that new engine in; he now has 4,000 pounds of thrust to break that rate of descent. You have quadrupled his safety margin.

We did not know how to quantify that, so they were not included in those numbers because that is something you do not know. Did he have a material failure or did he miss having an accident because he had the extra thrust? I can tell you from flying the airplane myself, it is a nice feature to be able to break that rate of descent when things are going wrong.

Where do we stand in our conversion? We have presently 102 of the day airplanes that do not have the fixes in them nor do they have the new engine. We have 52 night attack airplanes which do not have the latest fixes but have a new engine in it. Then we have the REMAN program, which includes the radar and a new engine. There are a total of 181 airplanes out there.

The program that is ongoing right now, if you look across the REMAN delivery line, that is how airplanes are delivered. So 2 years after we fund them, they are delivered to the fleet, and that is the rate that is shown in the President's budget right now as replacing them. I can thank members of this committee, by the way, for adding to that rate. You added four airplanes in 1996 which will be delivered in 1998, so you are helping us. In fact, you doubled the rate at which we can replace these. As you can see, though, it takes us out considerably more years before we can do that.

One of the things that N–88, Admiral McGinn and I have been discussing lately is, is there a subset of this REMAN program that we can expedite to try to get some of those airplanes that will not be REMAN-ned for a couple of years and just install the engine in it. Since the REMAN program installs the engine in later, can we do it earlier and try to bring up the safety record?

That takes us to our accidents. In October of this year, we had a pilot from the training squadron depart the airplane in a day attack. He subsequently flamed out the engine and in doing so accidentally knocked off the switch that would allow him to restart the engine. He then went down and ejected from the airplane and we got him back.

Two things. Would the new airplane have helped? The surge margin in the new engine is much higher than the surge margin in the old engine. Maybe the engine would not have flamed out. And two, the REMAN airplane has a more authoritative departure control system than the day attack airplane. So in two ways, it may have prevented that accident.

The next one came in February——

Mr. HUNTER. General, I do not want to start questioning now, but could you explain "the engine flamed out"? What makes that happen?

General BLOT. When he departed the airplane, it picked up a very fast yaw rate. When he did, he blanked out air from the engine, from going down the intake, and it caused it to compressor stall. It actually compressor stalled instead of flaming out. He then had to shut it off to try to get it back into action again and never was able to restart it and that was because the switch was in the wrong position.

The second accident was a takeoff into weather. It was not only the normal tragedy but it was a personal tragedy for me. The young man was my son's roommate during the cruise that they just made over where they picked up O'Grady. He was one of the young pilots who was involved in that. My son, by the way, is also a Harrier pilot, flying day attack airplanes right now.

He took off into the weather and he crashed. We are still determining what happened, but when the airplane hit the ground, the RPM was back in the 60 percent range where you would expect it to be up much higher range than that. I have no idea whether that was the cause of the accident or not, but it is suspected. It was a day attack airplane with the old engine.

Again in February, we had a day attack airplane take off, do a low level, and catch fire. That was enough for us. We said, we do not know what the answer is on either one of these yet but they both have the day attack configuration with the old engine and engines normally are the reason that airplanes catch fire, something going wrong with them, so we will stop and take a look.

The Commandant sent out a message that said, stop flying Harriers with the old engine in it and let us take a look, go back, look at your inspection techniques, relook at the engines, and ensure ourselves that we are doing it correctly. We did that.

We then went back into action again and then we had a series across the Marine Corps of accidents that we could not explain. We had an F–18D disappear off the coast of Carolina that we still do not know today. We have not found a trace of it. It just went off the radar scope and is gone. We had an AH–1W Cobra skid helicopter coming out of depot that the tail came off and killed both pilots. We had a CH–46 catch fire. We had another Harrier catch fire. Then we had an F–18 hit the ground.

We said, stop. We grounded all the airplanes in the Marine Corps and said, go back, take a look at our procedures. We called all the flag-rank officers, the wing commanders that fly airplanes that wear wings in the Marine Corps, and we went down to New Orleans off-site and we said, what are we doing? What is happening to us? Even though our rates are better than they were in the last several years, what is going on?

We then came up with some top-down solutions. We brought them back and we imposed them on the fleet right now. We said, slow down. We do not know if that is the answer. There is nothing obvious to us. But slow down and go ultra-conservative. We had this 48-hour standdown again for the whole fleet. We said, that is the Bottom-Up Review.

Gather up the results from all the wings, collate it, and we are going to meet again on the 22d out in El Toro, where we are bringing all the flag-rank officers in, we are bringing the safety center in, we are bringing anybody that can take a look over our shoulder, look at our procedures and say, are we doing something wrong? Is there something that is causing this or are we just going through a bad streak right now?

So these are the steps that we have taken to correct the situation we are in. We think that we have a handle on it right now. After the meeting on the 22d, I will know what course the Marine Corps will take for aviation to ensure that we protect the lives of our people and ensure the safety of our equipment.

Thank you very much, sir. The summary is essentially what I just gave. We have incorporated our training changes. We have made sure we had standardization. The REMAN program is competing for funds, like all other programs, and we are expediting it as much as we can. We are now having a safety meeting on the 22d.

[The prepared statement of General Blot follows:]

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STATEMENT OF

LIEUTENANT GENERAL HAROLD W. BLOT

UNITED STATES MARINE CORPS

DEPUTY CHIEF OF STAFF FOR AVIATION

HEADQUARTERS, U. S. MARINE CORPS

BEFORE THE

PROCUREMENT SUBCOMMITTEE OF THE

HOUSE NATIONAL SECURITY COMMITTEE

16 APRIL 1996

CONCERNING

AV-8B AVIATION SAFETY

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UNITED STATES MARINE CORPS

HEADQUARTERS MARINE CORPS, DIVISION OF PUBLIC AFFAIRS
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LIEUTENANT GENERAL HAROLD W. BLOT, USMC

Lieutenant General Harold W. Blot is the Deputy Chief of Staff for Aviation, Headquarters Marine Corps, Washington, D.C.

General Blot was born on Oct. 10, 1938 in Manhattan, N.Y., he graduated from Villanova University with a B.E. degree in June 1962, and was commissioned a second lieutenant in the Marine Corps. He also holds an M.S. degree from George Washington University (1980)

After completing instruction at The Basic School, Quantico, Va., he underwent flight training at Pensacola, Fla., and Beeville, Texas. His first operational assignment was to VMF-232, where he flew the F-8 Crusader. This assignment included a combat tour in Da Nang, Vietnam. In February 1967, General Blot reported to the 3d Marine Division in Phu Bai and took command of the Communications Company, Headquarters Battalion.

Returning from overseas, he was selected to attend the Aerospace Research Pilot School at Edwards Air Force Base in California Then he was assigned to the Naval Air Test Center, Patuxent River, Md., in 1968, as a Project Test Pilot. These two assignments alone accounted for testing over 25 models of tactical airplanes including a NF-104 rocket assisted flight to over 100,000 feet and over 200 flamed-out landings in various types of jet airplanes.

He joined VMA-513, the first Harrier Squadron in May 1971. During this assignment, he developed the use of thrust vectoring for Air Combat Maneuvering

In August 1975, he became the AV-8 Class Desk Officer at the Naval Air Systems Command.

From August 1979 until August 1980, he attended the Industrial College of the Armed Forces after which he assumed command of Headquarters and Maintenance Squadron 32. In March 1982, he planned the operations of and was later assigned as Commanding Officer of the three squadron "Harrier Carrier" deployment aboard LHA-4 to the Mediterranean Sea from which the procedures for today's tactical use of large numbers of Harriers at sea was developed. Returning to the states in July 1982, General Blot took command of VMA-231.

Upon relinquishing the reigns of VMA-231 in June 1983, he was assigned as the AV-8 Program Manager at the Naval Air Systems Command He was promoted to colonel in February 1984. General Blot was selected by the Secretary of the Navy to be reassigned as the Program Manager of the V-22 Osprey. He was advanced to brigadier general on April 15, 1988. General Blot was assigned duty as the Assistant Wing Commander, 3d Marine Aircraft Wing on Jan. 19, 1990.

On Jan. 15. 1991, he became the Commanding General of V MEF. With the success of Desert Storm and the return of I MEF, General Blot stood V MEF down and returned to his assignment as the Assistant Wing Commander of the 3d Marine Aircraft Wing.

On May 10. 1991, General Blot was additionally assigned as the Commander, Marine Corps Air Bases Western Area and the Commanding General, Marine Corps Air Station, El Toro. He was advanced to major general on May 24, 1991. He was assigned duty as the Commanding General, 3d Marine Aircraft Wing, MCAS, El Toro, Calif., on Aug. 16, 1991. He assumed duties as the Assistant Deputy Chief of Staff for Aviation, Headquarters Marine Corps, Washington, D.C., on July 23, 1993. General Blot was promoted and assumed his current duties in July 1994.

His medals and decorations include: the Distinguished Service Medal; Legion of Merit; Meritorious Service Medal; Air Medal with gold Numeral 1 and bronze Numeral 3; Combat Action Ribbon; Presidential Unit Citation and one bronze star; Meritorious Unit Commendation; National Defense Service Medal; Vietnam Service Medal with bronze star; Sea Service Deployment Ribbon; Republic of Vietnam Meritorious Unit Citation (Gallantry Cross Color); and the Republic of Vietnam Campaign Medal with device.

Lieutenant General Blot is married to the former Marie Frasmer of Atlantic City, New Jersey. They have four children: Harold Jr., Michael, Thomas and Caroline.

(Revised Jan. 9, 1995 HQMC)

PREPARED STATEMENT OF LIEUTENANT GENERAL HAROLD W. BLOT

DEPUTY CHIEF OF STAFF FOR AVIATION, HEADQUARTERS, U. S. MARINE CORPS

INTRODUCTION

Mr. Chairman and distinguished members of the Subcommittee, I thank you for the opportunity to appear before you to discuss Marine Corps Tactical Aviation and, in particular, AV-8B safety.

The Naval Aviation Safety Program is the corner stone by which Marine Aviation operates. Safety programs, by design, are evolutionary in nature, capable of redirecting focus as circumstances and evidence dictate. These programs must be proactive if they are to succeed in improving aviation safety. Since the introduction of the Naval Air Training and Operating Procedures Standardization Program (NATOPS) and the Naval Aviation Safety Programs (NASP) in the early 1950s, the effect on aviation safety has been dramatic. From a mishap rate of 55 per 100,000 hours in 1954 the percentage has improved to rates below 5 in the 1990s.

The AV-8A, introduced to the Marine Corps in 1971, was the first generation of aircraft that embodied unique vertical take-off and land capabilities. The AV-8A was retired from the Marine Corps in 1986. From the AV-8A's proof of concept and capabilities, evolved the AV-8B - an aircraft with significant improvements in handling, aerodynamic performance, warfighting capabilities, reliability and maintainability. Aviation safety lessons learned with the AV-8A, such as enhanced engine design and improved aircraft stability systems, were inserted directly into the design of the AV-8B, the second generation of American VSTOL tactical aviation. We have not stopped there. As the service life of the AV-8B matures, we continue to direct our focus to those areas requiring attention, with dramatic effects similar to the overall Naval Aviation Safety Program.

The AV-8B Mishap Rate peaked in 1990 at 24.2/100,000 hours. It is typical for the military to experience high mishap rates early in the life of the airframe and occasional "spikes" as the rate lowers due to experience and design improvements. The AV-8B is no exception. The AV-8B community is very small, only seven tactical squadrons with 140 aircraft exist. As a result, the mishap rate is very sensitive to small numbers. One accident per year causes the Harrier's accident rate to jump approximately 2and1/2 percent. Nevertheless, we recognized that the 1990 rate was excessive and we set to work identifying the problems. Engine related material failures and pilot procedural errors were identified as significant causal factors. Part of the problem was that the community received an influx of inexperienced VSTOL aviators. In 1991 the number of mishaps were almost halved to 12.6/100,000, however, the number of accidents involving pilot error remained about the same. A new focus was required.

In 1992, the first VSTOL Safety Symposium was held. Individuals from all facets of VSTOL aviation were in attendance. The purpose of the symposium was to study, in depth, the mishap rate of the AV-8B, and determine the steps required to improve it. The symposium results highlighted three general causal factors contributing to the high accident rate: (1) pilot factor, (2) engine malfunctions, and (3) material failure.

The symposium recommended an independent study to address the pilot factor issues. As a result of the study initiated in 1992 by CAE-Link Corporation, changes were made to the Marine Corps Training and Readiness Manual (T&R) and the AV-8B NATOPS Manual. The AV-8B's Training Syllabus was changed to address the mishap causal factors and the demanding VSTOL flight regime. More emphasis was placed in the take-off and landing modes of flight. Additionally, the Fleet Replacement Squadron, where initial AV-8B training occurs, was given an increase in maintenance personnel and instructor manning. Finally, Standard Operating Procedures (SOPs) were promulgated for the AV-8B community to augment the T&R Manual and NATOPS. The SOPs required increased standardization training along with squadron level Aircrew Coordination Training Programs.

From a material perspective, the symposium recommended the incorporation of Engine Monitoring Systems as well as retrofitting the entire AV-8B fleet, which was powered by Rolls Royce F402-RR-406 engines, with the follow-on Rolls Royce F402-RR-408 engine. As a result, both of these have been included in the AV-8B II+ Radar Night Attack aircraft which was delivered to the Marine Corps in 1993. Unfortunately, our Day Attack aircraft do not have these fixes incorporated.

The 1992 VSTOL Symposium was heralded by the Naval Safety Center as a model program. Since that date, the symposium has continued on an annual basis. The mishap rate dropped dramatically from 24.2 in 1990, to 7.9 in 1993, the year that the 1st production AV-8B II+ Radar/ Night Attack aircraft was delivered to the fleet. The AV-8B community was clearly addressing pilot error and standardization problems, nevertheless, the mishap rate increased slightly in 1994 and remained steady in 1995.

In 1994 the AV-8B Safety program identified five new material problem areas which were significant contributors to the mishap rate. Accordingly, the decision was made to fund these five safety Engineering Change Proposals: (1) Nose Wheel Steering modification, (2) Inlet Guide Vane modification, (3) Flap Electronic Control modification, (4) Jet Pipe Temperature modification, and (5) Digital Electronic Fuel Control modification. These changes will be totally completed by the end of FY-02.

As you are aware, the Commandant of the Marine Corps ordered a cessation of AV-8B Day Attack aircraft flight operations on 29 February of this year. His order followed a second AV-8B mishap in as many weeks. In essence, the Commandant wanted a standdown of operations while the entire chain of command reviewed its operational and maintenance procedures in order to focus on AV-8B actions that normally result in further reducing mishap rates. In a separate but related action, the Naval Air Systems Command assembled a team of technical and operational experts to conduct a "quick-look" assessment of the two recent FY 96 mishaps to determine if there were any trends.

The team determined that the only common thread between the two mishaps was that both jets were AV-8B Day Attack aircraft with the older Rolls Royce F402-RR-406 engine. Based on the Naval Air Systems Command "quick-look" report, the fleet was directed to continue with a one time inspection of the -406 engine second stage High Pressure Turbine, and other related recurring engine inspections. Following the engine inspections, the Commandant directed that aircrew training concentrate on compound emergencies and ejection decision criteria before flight operations resumed.

The AV-8B Remanufacture Program, initiated in 1994, will take 72 older AV-8B Day Attack aircraft and convert them to the AV-8B II+ Radar Night Attack configuration. The Remanufacture Program incorporates the new 408 engine with all of the latest safety ECPs. The Remanufacture Program modernizes existing aircraft at 80% of the cost of a new production AV-8B II+. The Remanufacture Program is vital to the Marine Corps, from both operational and safety aspects, to bridge the gap until the arrival of the Joint Strike Fighter in the 2008 time frame. The first remanufactured aircraft was delivered in January of this year, one month ahead of schedule.

The Marine Corps desires an AV-8B remanufacture profile which increases conversion rates. This would achieve two goals: First, older aircraft are replaced with newer ones, thereby maximizing safety and operational capability; second, higher remanufacture rates are most cost effective. Due to fiscal constraints, we have not been able to meet these higher "Reman" rates due to funding adjustments. The remanufacture profile has been restructured several times, with negative impacts on program stability. The best solution from a Marine Corps point of view, would be to remanufacture all of the older Day Attack aircraft at a higher rate while also incorporating all the latest safety "fixes". Additional cost savings could be gained by using a multiple year procurement (MYP) profile. This effort could be accomplished as quickly as operationally feasible under a multi-year procurement strategy which will, in turn, incorporate all the latest safety "fixes".

In closing, I would like to say that the AV-8B safety program is, and will remain, proactive. We believe the identified AV-8B engine upgrades and the five major safety ECPs will go a long way towards meeting that goal. While I am realistic about human and material mishap factors in Tactical Aviation, nevertheless, our goal is to continue to reduce our mishap rate. Our goal is a zero accident rate.

On behalf of Marines everywhere and our Commandant, I thank you again, Mr. Chairman, for permitting me to speak to you today, and I thank you, as well, for the steadfast faith and trust that your Committee places in our Corps.

Mr. HUNTER. Thank you, General Blot.

To my colleagues, the way I thought we might go with respect to questioning on this, because the central issue here is the mishaps that have occurred and specifically what occurred with each one of those mishaps, if you could go back to your last slide that you had for the Marine Corps presentation, I thought what we would do is walk through these with questions from our members.

Since you have just completed your testimony, General, I thought we would give all members a chance to ask questions about those specific accidents and then go to the Navy and do the same thing. I know we have two additional witnesses to talk about those two accidents.

We also have Mr. Peterson here, who, along with Mr. Cunningham, has great capability in aviation, and Pete, thank you for being here today and being concerned about this issue.

Do any members have any specific questions about these accidents that are on this chart that the general has just mentioned? General, you did a good job.

Mr. SISISKY. Mr. Chairman.

Mr. HUNTER. Go right ahead, Mr. Sisisky.

Mr. SISISKY. This is not a specific question to that, but you talked about the money that we appropriated last year for the Harriers. They will not be ready until 1998? What is the length of time it takes?

General BLOT. A normal jet aircraft takes 2 to 3 years to produce. From the time you fund it until the time it rolls off the line and appears in the flight line is between 24 and 36 months.

Mr. SISISKY. How much does it cost to repair it?

General BLOT. It depends on the scope of that. The REMAN program is a major change. There is about 80 percent of that airplane that is new, so it is just rolling down a production line. In fact, if you went out to McDonnell-Douglas where the airplane is made, you would not be able to differentiate between a REMAN line and a production line.

Mr. SISISKY. And they are not done in any Federal facilities, they are done at the manufacturer's level, is that what you are saying?

General BLOT. The bulk of the work is done at McDonnell-Douglas. What happens is we take an existing AV–8B, we put it into the depot at Cherry Point, we break it down and take those parts that are reusable, that McDonnell-Douglas can use over again, and that is possible on this airplane because it is the first of the composite airplanes to come out. For example, the wing seems that it does not have a life on it. It will just go as long as the airplane will.

We then send it out to McDonnell–Douglas and then they put a new fuselage and a new engine and a new cockpit on it and it is delivered to the fleet after that. So there is some work done at the Marine Corps depot down in Cherry Point.

Mr. SISISKY. Thank you.

Mr. HUNTER. Mr. Peterson, go right ahead.

Mr. PETERSON. You have a unique airplane here, sir, but it is not the only service using it. You did not address the experience the British may be having with the same aircraft in the same circumstances, and it seems to me that they would have some accident data that would essentially fortify your positions. Is there any exchange there that would assist, or are you getting that all through the manufacturer?

General BLOT. No, sir. We do, in fact, have exchange officers in the British squadrons. They have exchange officers in our squadrons and we keep a dialog going. Their accident rate, other than this spike that we had, is very similar to ours, and that includes the Spanish. The Italians now are new and they have not crashed an airplane, so they have a very good accident rate. But we do exchange data.

Mr. PETERSON. Are there any similarities with these incidents that you are looking at and you are having standdowns, when you are having the standdowns, are you looking at those other services' circumstances and saying, hey, we had a fire. Is there a problem here? You can generally find out where a fire started.

General BLOT. Yes, sir.

Mr. PETERSON. That is a case that the whole fleet, then, gets inspected for that specific problem and so on, meaning the fleet worldwide. Was there anything found in that process that would lead you to suggest that there is a problem with just the engine creating a fire?

General BLOT. No, sir. These are ongoing as we speak right now. The preliminary indications are that there could have been a fuel leak around the seals where the engine sits in. So my belief would be it was not a fire caused by the engine throwing blades. Now, was it caused by the fact that we are removing the old engine rapidly because of its reliability problems? That is something else that we have to look at.

We do compare notes. We have a very thorough—we use the Navy system of accident investigation. We are an integral part of that. So we use the same system, which is an extremely thorough way of doing it, and we take all information available plus anybody across the world who is flying a similar airplane.

Mr. PETERSON. Thank you, Mr. Chairman.

Mr. HUNTER. Mr. Skelton.

Mr. SKELTON. Thank you, Mr. Chairman.

Back in the authorization bill for fiscal year 1992, on page 46 of the report of this committee, language is found where the amended budget request contained $19.8 million for the AV–8B Harrier modifications for the year 1992. General, are you familiar with that recommendation?

General BLOT. Yes, sir.

Mr. SKELTON. The language is found that states, "In addition, the committee understands that the Harrier crashes at nearly three times the rate of other modern aircraft, and despite the fact that the AV–8B is on its third new engine since being introduced in 1985, 78 percent of the crashes were attributed to the engine failure." Further, the report states that the committee recommends authorization of $19.8 million for AV–8B modifications for fiscal year 1992 and the committee directs the Secretary of Defense to develop an AV–8B upgrade replacement plan that addresses the issues raised above as well as lessons learned from Desert Storm. Was that done?

General BLOT. That is the REMAN program, sir. That is where we take the airplane and reengine it, put a new cockpit on it so it increases the situation awareness, and put a higher authority departure control system in.

Mr. SKELTON. So that has been complied with?

General BLOT. That is correct, sir.

Mr. SKELTON. So now we are at another level of the problem with this same airplane?

General BLOT. We are still attempting to complete that program. As in the chart I showed before, sir, the bulk of the fleet out there has not yet gone through that process.

Mr. HUNTER. Would the gentleman yield on that question?

Mr. SKELTON. Yes. Thank you.

Mr. HUNTER. General, these four incidents that you have on the board, October 1995, two in February 1996, and March 1996, did those involve REMAN-ned aircraft, aircraft that had been remanufactured, or those were the old aircraft?

General BLOT. Those were the old airplanes.

Mr. HUNTER. If you were going for a simple analysis for Members of Congress to tell us what the importance of the remanufacturing process is with respect to safety, would you say that it improves safety 50 percent, 60 percent, 10 percent? What importance would you attach to the remanufacturing process?

General BLOT. Yes, sir; could you put up the chart where we had the bars on there that show that? The column on the left is the day attack airplane. The column on the far right is after you REMAN it, and that is our analytical judgment of the safety improvement. So it would go from an accident rate of 13 to an accident rate of 6, or roughly a 50-percent improvement.

Mr. HUNTER. So you could cut the accident rate roughly 50 percent?

General BLOT. Yes, sir.

Mr. HUNTER. But you only have three REMAN-ned aircraft in fiscal year 1996.

General BLOT. That were delivered.

Mr. HUNTER. That were delivered?

General BLOT. That is the delivery schedule, yes, sir. The program is competing for funds along with all the rest of the programs.

Mr. HUNTER. So obviously, you think, general, this is a very critical program from the perspective of safety?

General BLOT. Yes, sir.

Mr. HUNTER. Do any other members have questions with respect to the AV–8B? Mr. Peterson.

Mr. PETERSON. Just the numbers, the REMAN, you are not going to do the entire fleet, because your numbers here do not come up anywhere close to 181.

General BLOT. That is correct.

Mr. PETERSON. What are you doing?

General BLOT. Right now, the program only includes 72. That was financially constrained. We will reenter that as we close in on the end of the program. There are additionally 24 airplanes out there that are not addressed. What we are going to look at is will we add those on to the end or will we just put a new engine in them or what will we do with them? That is an ongoing program objective memorandum [POM] 1998 discussion.

Mr. HUNTER. Let me follow up on Pete's question, then. You are saying that even though this is a very important process in terms of safety, that the Marine Corps has made a decision at this point not to do a REMAN of the entire Marine inventory?

General BLOT. That is right. There are 24 airplanes that are not contained in this program and it was done because of the fiscal constraints that were placed on the program.

Mr. HUNTER. If you had your druthers, obviously, you would rather do them, would you not?

General BLOT. That is correct.

Mr. HUNTER. Pete, do you have anything else you want to ask?

Mr. PETERSON. The question is, at what time would this decision be made, or are you asking us this year to help with that decision?

General BLOT. No, sir; that decision would be added to the end of the program when it is truncated at 72, which is probably a decision to be either made in the POM 1998 or the POM 2000 deliberation.

Mr. TALENT. Mr. Chairman.

Mr. HUNTER. Yes?

Mr. TALENT. Along those lines, I notice in your statement, general, about the effect on costs of delaying the program. It is kind of frustrating, given the fact that we are not refitting the whole fleet anyway, that the longer it takes to do it, the less bang we are going to get for the buck. Do you want to comment on that?

General BLOT. Yes, sir. It is true. It is just a question of, again, we are trying to get the various things that the services need all into a budget that is constrained and it has to compete along with other programs for whatever funds are available.

Mr. HUNTER. But I take it, general, from your perspective, you have put pilots at risk because of this slow process, this slow remanufacturing of aircraft, is that a fair statement? I do not want to put words in your mouth, but you have given us a pretty dramatic safety improvement as a result of remanufacturing and then you show us a projected budget that does not do too much to accomplish that.

General BLOT. Sir, we feel that the day airplane is still a safe airplane to fly. We have procedures in place that have been developed by our engineers in the Naval Air Systems Command that would prevent an airplane that is unsafe from flying. Certainly, when you go through this and you replace the parts and you put more safety improvements in it, it is a safer airplane to fly, but we would not fly an airplane that we feel is putting pilots at risk, sir.

Mr. HUNTER. But your total accident rate, as I understand, on AV–8B's, if you categorize them in a package, is that roughly one-third of them have crashed, is that right? That is a figure that I saw. Is that right?

General BLOT. That is about right.

Mr. HUNTER. You would like to improve on that, if possible.

General BLOT. Yes, sir.

Mr. HUNTER. Pardon me, general, but as a guy who flies back and forth to San Diego every week, I do not classify that as an aircraft that is safe. I guess it all depends what you are comparing it to. But in terms of the young people that fly these aircraft and the fact that we would like to have them around for a while, that is a pretty high accident rate.

General BLOT. Yes, sir.

Mr. HUNTER. I understand that it has a tough mission, and the VSTOL aspect is a difficult aspect.

General BLOT. Yes, sir, and we have procedures in place to try to get it down into the range that other airplanes are in.

Mr. PETERSON. Mr. Chairman.

Mr. HUNTER. Yes?

Mr. PETERSON. This cost thing, you are going to have attrition. You will continue to have accidents. There is a cost associated with that. There is a potential for accelerating or grouping the contract and thereby buying a larger buy, maybe cheaper, as was suggested here. You are working on two ends of this. It seems to me that if you are looking at total out-year savings, that it might be beneficial to make this decision earlier than 1998, is what I am getting at.

Have you looked at the total economic process here as it applies to your losses? If you just used the 5.5, which you cannot because you are at 13.2 or 13.3, if you use that, you are going to lose x-number of those 24 airplanes that we are talking about. So can you give me a feel for the economy of scale here of what we could do if we move this into a larger buy? Instead of buying into a REMAN of 72, go ahead and buy in at whatever it be, 96 airplanes or whatever it is.

General BLOT. Yes, sir. We looked at increasing the rate per year and going into a multiyear procurement. The multiyear procurement by itself would chop about 7 to 10 percent off the cost of each year's program. Each airplane would be that much less expensive. And certainly, if you increase the rates, then the individual airplanes become less expensive. Again, it is just another piece of equipment that we have in our inventory that has to compete for funds.

Mr. PETERSON. But you are not going to have that many left. You are going to lose these birds. They are not going to be there in 1998 if you use your best numbers here in attrition.

General BLOT. If we run what we call a waterfall chart out that shows losses against fleet requirements, we can make it out until the time that the Joint Strike Fighter would appear on the horizon, which would be about 2010. So we have enough airplanes to make it to that period of time, given the attrition rate not as you see with these four accidents but as we anticipate it, which would be a normal attrition that we have had over the last 3 years.

Mr. PETERSON. I am just concerned that if everybody has done all the math here, you are not looking at whether or not you have 24 airplanes left. You are looking at whether or not you can continue to do the mission that you have been obligated to carry out.

General BLOT. That is correct, sir.

Mr. PETERSON. And you are saying that you are going to have enough machines on the ground to do that.

General BLOT. We will have enough machines, yes, sir.

Mr. PETERSON. Thank you, Mr. Chairman.

Mr. HUNTER. Thank you, Mr. Peterson.

We are going to leave the Marine Corps sector now and go to the Navy and to specific Navy mishaps. Before we do that, I just want to make sure every member has had a chance to ask any questions that they want to ask of the Marines because this is your chance to do it. I think we have had a good discussion here.

Mr. SISISKY. Mr. Chairman, what is the cost of the total program of doing the 72 aircraft?

General BLOT. It was about a $2 billion program, sir.

Mr. SISISKY. Two billion? If you would lose three airplanes a year, which is what we have lost already and I hope to God we do not lose any more, what is the price of a Harrier now?

General BLOT. It is about $26 million a copy, sir.

Mr. SISISKY. I am not talking about to repair them now. I am talking about to buy them new.

General BLOT. To buy them new would be about $36 million a copy.

Mr. SISISKY. Thirty-six million a copy? So that is $100 million a year. That is a hell of a lot of interest that we could save.

Mr. HUNTER. General, your accident rate is how many per year?

General BLOT. We have been losing about four to five a year.

Mr. HUNTER. Four to five, so you are really losing a little over $150 million worth of aircraft a year. How many of those involve fatalities of the pilot?

General BLOT. Out of these, we have one fatality, sir.

Mr. HUNTER. Would you say it is 25 percent of your accidents?

General BLOT. I would think so, sir.

Mr. HUNTER. Duke.

Mr. CUNNINGHAM. Just to be real succinct, the next airplane you really have coming on the line is the JAST.

General BLOT. Yes, sir.

Mr. CUNNINGHAM. Can you stretch the airplanes if JAST is slid for any reason? I understand that this is really a critical program to replace these.

General BLOT. Sir, we have very little margin in there.

Mr. CUNNINGHAM. Thank you.

Mr. HUNTER. Mr. Skelton.

Mr. SKELTON. I again point out to the Marines, you may be overly optimistic on the production of the future JAST. I speak with some knowledge of the history of airplane production. Nothing is ahead of time. You are very lucky if they are on time. If you are betting, bet that they will be later. I raised this the other day regarding the lack of the Marine Corps request for additional F/A–18's and it applies in this, as well. As I had an old law professor who would say, think about it.

General BLOT. Yes, sir. I was a former program manager and I understand exactly what you are saying. Reasonably, I would say if we aim for 2008 for the Joint Strike Fighter, we will get it in 2010. However, if we aim for 2010, we will get it in 2012. That is kind of the theory that we are going by.

Mr. SKELTON. Mr. Chairman, I have two quick comments. The first relates in general to military aviation and that is the nature of the pilot is one that has to, as part of his or her character, take risks. It is not for the easy going type of person to want to be a pilot, a military pilot, much less take off and land on aircraft carriers. It is the person that pushes the envelope.

So in all of this, I hope you do not dampen the spirits of those who fly dangerous missions and perform admirably for our country. I would hate for that to be a fallout of this, though obviously we can do better in the safety area. But do not dampen the spirits of those young folks in the process.

Second, Mr. Chairman, regarding the General Accounting Office report that we discussed a bit earlier, I am going to at the proper time offer legislation that would require two things. One is at least one voting member of a mishap accident board, and as you know, each service has a mishap accident board and they are made up somewhat differently now, but at least one voting board member be a representative from the service's safety center, a voting member. That is important. And two, that a majority of the membership of the mishap investigation board be appointed from units outside the chain of command of the mishap unit. Both of these would ensure the independence and objectivity of the mishap board recommendations and results.

At the proper time, I would offer that and I would hope that the committee would look favorably upon such an amendment. Thank you.

Mr. HUNTER. I thank the distinguished gentleman.

I want to inform my colleagues, I think that probably concludes the questions for the Marine portion of the briefing. We have a journal vote on to bring Members to the floor for the purpose of swearing in a new Member, so we will adjourn for the vote. We will come back, and at that point, Admiral Johnson, you and Admiral Cook and Captain Snodgrass can walk us through the Navy mishaps and deal with questions on those mishaps.

Admiral JOHNSON. All right, sir.

Mr. HUNTER. Thank you.

[Recess.]

Mr. HUNTER. The hearing will resume.

Admiral Johnson, you have brought to the witness table Rear Adm. Jeffrey Cook, who is the program executive officer for tactical aircraft programs, and also Capt. Dale Snodgrass, who is the commander, fighter wing, U.S. Atlantic. Captain Snodgrass has over 5,200 tactical jet hours, including 3,700 hours in the F–14 and 1,084 carrier arrested landings and has, I know, been very closely associated with the investigation of the F–14 crashes.

What I think we ought to do now is to walk through those crashes one at a time. You can start with Tennessee if you want to, but I would like you to walk through each one of those so that the committee understands exactly what happened from the Navy perspective and what your conclusion is. Go ahead.

Admiral JOHNSON. All right, Mr. Chairman. I will start with the Nashville mishap. As you know, we released the Judge Advocate General's investigation last Friday. I think probably what might be useful, we discussed the pilot error causal factor. That is our decision. We feel very confident that that was the primary cause.

I think it might be useful if I could ask Captain Snodgrass just to take you through the flight, if you will, to give you some sense of what Lt. Comdr. Bates and Lieutenant Higgins were facing in that environment. Dale.

Mr. HUNTER. Excellent. Captain Snodgrass, why do you not walk us through the flight?

Captain SNODGRASS. Thank you. It is a pleasure to be here, Mr. Chairman.

The flight was on the January 29 and it was a cross-country flight, a returning cross-country flight from Nashville, TN, scheduled for two low-level flights in-route back home to NAS Miramar. In that process, they briefed those flights. The weather was 2,300-foot overcast with the tops of the cloud decks somewhere between 7,000 and 10,000 feet.

In the process of their flight planning, they did some initial liaison with the tower and Federal Aviation folks at Nashville and requested an unrestricted climb to 15,000 feet. An unrestricted climb to 15,000 feet is an authorized event, and really what it does, it eliminates altitude restrictions in a normal standard instrument departure which may cause you normally to level off at 5,000 feet or 10,000 feet for a finite amount of time. So it relieves you of those altitude restrictions.

In this case, Lt. Comdr. Bates, when he did take off, violated a Navy procedure and a Federal Aviation Administration [FAA] procedure in that he apparently rotated the aircraft to an angle of climb in excess of 45 degrees, which is, by definition, the limit, and he went to something in excess of 50 degrees.

That particular takeoff, and when he did take off, he did sort of a level transition, rolled down the runway approximately 4,000 feet, rotated the aircraft as it accelerated to 150 to 160 knots, bunted the nose over slightly, raised the landing gear and the flaps, and then accelerated down the runway approximately 2,000 more feet. Approximately 6,000 feet of runway traveled, he then did about a 3 to 3.5 G, positive G, pitch to this attitude of about 50 to 55 degrees.

That particular maneuver is done primarily externally. Your eyesight, you are looking outside the cockpit. You are not spending a lot of time inside the cockpit. You are looking at peripheral vision, the runway, et cetera, and then scanning. Probably 75 percent of your time is outside and 25 percent is inside, looking at particularly your air speed and your engine instruments to make sure that everything is functional.

At 6,000 feet down the runway, he put about a 3.5 G pull on the airplane and pulled it up in excess of 45 degrees and what we think is probably closer to 55 degrees. In my opinion, he did that visually and did not do that on instruments. Then as soon as he established that climb, he penetrated the clouds in this 55-degrees nose-high attitude.

Mr. HUNTER. Hold it right there. Is that a normal takeoff? Is that a recommended takeoff, for those of us who are laymen?

Captain SNODGRASS. No. No. As I said before, an unrestricted climb is not out of the ordinary. It is not something that we do every single day, but it is something that the majority of us have done on occasion, and it is an authorized thing. To exceed the 45 degrees is not allowed and is, in fact, a procedural error.

In my opinion and in the opinion of the Judge Advocate General [JAG], it was also a significant judgment error to do it in what we consider instrument flight rules [IFR], or instrument flight conditions. In other words, to penetrate a cloud, to penetrate instrument flight conditions in a nose-high condition like that demonstrated poor judgment. In my 20 years and now 4,000 hours flying the F–14, most of us would never consider doing that. So he made a judgment error.

Mr. HUNTER. Paint for us again the cloud picture, if you will. What was the visibility?

Captain SNODGRASS. The visibility underneath, I think was very good. It was in excess of 7 to 10 miles, so it was clear. It was a classic kind of winter undercast of which the cloud deck was a 2,300-foot mean sea level [MSL] and I believe the elevation of the field is somewhere in the 400-foot regime. So he had approximately 2,000 feet of clear air space below this cloud deck, of which there was essentially unrestricted visibility.

As he pulled on the airplane, he now put a fairly significant pitch rate on the airplane and positive G, which is fueling G's, which in layman's terms, the blood is now—it is like going in a roller coaster. You feel yourself being kind of squashed. He did that and then penetrated the cloud.

In the profiles that the test pilots at Patuxent River flew, all these various scenarios, the one that fit the best was as he penetrated the clouds, shortly thereafter, he came out of full afterburner, which, by the way, is probably a key factor in that he took off in full afterburner which is a normal configuration for a F–14A, and we do that for two specific reasons.

One, it reduces our overall takeoff roll. Therefore, if we do have to abort, it gives us more runway at the end of the runway to stop. Then the other one is, if we do happen to lose an engine, particularly at full or gross weights, or larger gross weights, it gives us the ability to have what we call single engine flyaway. The point is, it is a normal takeoff configuration, so using full afterburner is normal. The F–14B's and D's, because of their significant thrust increase, particularly in military power, do military takeoffs as the rule.

But that is the profile. He enters the cloud in about a 55 to 55 degrees nose-high and shortly after, 3 to 4 seconds after penetrating the cloud, reduces the power, comes out of afterburner to military power. Why, I am not exactly sure, nor was the JAG able to tell because we are obviously not, unfortunately, able to talk to the pilot. If you were going to do a climb to 15,000 feet unrestricted, you would normally leave it in afterburner the whole time. So it is a possibility, and the JAG investigation showed that there possibly may have been something internal to the cockpit that caused him to break down his scan or concentrate on something else.

But in my opinion, what happened, and this concurs with the JAG, is that at some point when he penetrated the clouds, he did not transfer from what I think was his visual arena to a proper instrument scan, which is you have to get on what is for us in the F–14A the vertical display indicator, which is our primary attitude reference, and you have to fly that. We go through in our Naval training a lot of instrument emphasis from day one all the way through even my time. So every year we do this process and flying instruments and believing the instruments is a critical function, because we are taught that you sometimes cannot believe what your body is telling you and you have to believe the instruments.

Mr. HUNTER. So as you go up, as you ascent, you obviously start out visual and you are looking out the cockpit and you are doing everything by your sight in reference to the outside world.

Captain SNODGRASS. Exactly.

Mr. HUNTER. At some point, you transition during this climb to the instrument panel, is that what you are saying?

Captain SNODGRASS. Yes. Normally, when you take off in day VFR conditions, you will time-share your scan from visual to internal the cockpit, checking your instruments and et cetera. But initially when you take off in day visual flight rules [VFR] conditions, it is probably about 70 percent outside the cockpit and 30 percent inside the cockpit. Once you go into instrument conditions, we are trained to go 100 percent inside the cockpit and focus on our attitude reference.

In this case, he comes up through the flight, continues to profile to an apex of about 5,200 feet MSL, above mean sea level, and then at that point, prior to that, the airplane starts a bunting over situation, where he gets—actually, on the profile, it looks like to be something almost to three-quarters of a negative G.

In that process, what we postulate is that he had a case of what we call vertigo, or somatogravic illusion, to be specific, which is a subspecies of that, and that is a situation where your body still thinks you are pulling into the vertical. Because of the 3 G's on the bottom, his inner ear, his body felt like it was still going like this. So he pushes the airplane over, in my opinion, is not looking at the instruments and believing the instruments, pushes over.

So he winds up pushing over into a position where he is almost 45 and almost 60, 70 degrees nose low, still thinking his body, if he relies on his inner senses, seat of the pants, if you will, he still thinks he is level or still climbing, so that is why he continues to push.

Mr. HUNTER. So when that happens, the pilot loses his perception, a valid perception of his position with respect to the horizontal. He thinks he is level with the ground but he is really going straight down at it.

Captain SNODGRASS. Actually, he thinks he is probably still climbing. Therefore, he is still pushing. He still feels the airplane is going like this when in actuality he is pushing to stop this, but he has overcompensated and is now like this.

Mr. HUNTER. Is he in the clouds at this time?

Captain SNODGRASS. Yes.

Mr. HUNTER. So he has no outside reference?

Captain SNODGRASS. He has no reference.

Mr. HUNTER. If he was up above the clouds, he obviously would see the cloud layer below him and would be able to orient on the cloud layer.

Captain SNODGRASS. Yes, sir. That is correct. In that process, the airplane also falls off from close to about 90 degrees or 70 to 80 degrees off its original heading and he winds up coming out of the clouds in a very nose-low attitude with the airplane accelerating through approximately 350 knots.

He comes out of the clouds. Now, you only have 2,000 feet of actual VFR clearance at that point between the bottom of the clouds and the surface there at Nashville, the ground. As soon as he breaks out of the clouds, he almost instantly recognizes where he is. Therefore, what I believe is he was not looking at his instruments this whole time. So he gets in there, comes out of the clouds, and then puts on a very hard positive G pull, probably to the tune of at least 5.5 and maybe as high as 7 G's, and that is based on the exact air speed when he executed the pull.

The aircraft actually translates in this less than 2,000 feet of altitude after he comes out of the cloud before the ground into and above—the airplane actually comes above the horizon, so he has done what we call a big instantaneous G pull, and because the airplane pulls through, establishes nose high, slightly nose high, but still has a very large rate of descent in about 10,000-plus feet per minute. So he impacts the ground in a level to slightly nose attitude going approximately 300 knots, but in a flat attitude.

Mr. HUNTER. So once he broke the cloud layer, he regained his visual orientation——

Captain SNODGRASS. As he regained spatial orientation of where he was, he rapidly tried to salvage the situation, which as any pilot's first response is, he leveled his wings and pulled on the stick. At the same time, he had been in what we think is military power and he went to full—he staged up. He selected full afterburner to give him more thrust that would help his turn at that point.

When the airplane impacted the ground, the engines were operating normally. In other words, they were at 100 percent power. The turbine section was 100 percent power, full military power, and the afterburners, the left afterburner, we physically determined in the engineering investigation that it was staging up from—it was going through stage three of the afterburner. The F–14A TF30 has five stages of afterburner, one being the lowest and five being full afterburner, so it was staging up.

The right engine afterburner section, we were unable to determine that specifically but there was nothing else wrong with the engine and we believe that that engine was also staging up to full afterburner but was about two-thirds of the way there.

Mr. HUNTER. Incidentally, if any of my colleagues want to jump in, there are just a few of us here and we have a chance to really brief out these individual incidents, so just go right ahead and ask any questions you want at this time. Are there any questions on this first incident? Duke, go ahead, and then Ike and Pete.

Mr. CUNNINGHAM. Can you describe the vestibular problems that a pilot goes through when they are——

Captain SNODGRASS. In this case, as I said before, his inner ear and his seat-of-the-pants feeling was that the airplane was continuing in what you would consider a looping-type maneuver. So his body, if he closed his eyes, if he was in the airplane and closed his eyes, he felt like he was continuing on top of his back. Therefore, he wanted to stop that continued vertical pull or positive G full and applied forward stick. When he did that, he started here and just continued to do that for 8 or 10 seconds, which wound up in a very nose-low condition.

So it was a case of—the specific subspecies of vertigo is called somatogravic illusion, and historically, I think the JAG and the accident investigation team went back and found four or five other instances, none of which were F–14's but included F–16's and F–18's, where similar type things occurred in the past.

From my point and that of the wing commander and squadron commanding officer's [COs'] and the training side of the house, vertigo training is something that we deal with from the very beginning of our naval aviation career. We go through physiology training, which specifically addresses these instances as one of them, and including night vision problems. The vertigo scenario for us, particularly in the instrument flying conditions around the ship when it is very dark out, particularly if you are coming out of a thunderstorm or in clouds, et cetera, it is something that we deal with all the time and put a lot of emphasis.

This particular species or this particular pushover-type one is one that we do not train to a lot because it is not a normal flight regime that we fly in. But overall, we spend a lot of time on physiological training. Every pilot and every naval flight officer's [NFO] in the Navy goes through a 2-day specific training in this once every 4 years, and then every year it is emphasized again in their annual instrument training, and then we emphasize it in our out-of-control flight training.

In fact, out of this, I am having a physiologist attached to my staff now to help—hopefully, to once again educate us in this particular situation.

Admiral JOHNSON. If I could hop in, Mr. Chairman, it might be worth mentioning, and Captain Snodgrass touched on it earlier, regarding the specific profile that that aircraft took, we feel very confident that we know different points in the sky that that airplane went through. We reconstructed from the FAA tapes, where there were a total, I believe, of four radar hits that help us scribe an arc through the sky, as well as, as Dale mentioned, we ran literally dozens of simulator runs to come to some understanding of how we could have gotten the airplane from point A through those sky points to the crash site. So we feel fairly confident that we know the profile that the airplane took in the sky.

Captain SNODGRASS. And obviously, we knew exactly when the airplane took off to the second and we knew when it crashed to the second, so it was a very simple time distance.

Mr. CUNNINGHAM. The reason I asked the question, I think it is important for the committee to understand the different vestibular reactions. Vertigo for aviators is a constant battle, and this kind of thing.

My point would be that if you know you are going to have to level off, and say you have an altitude restruction into the goo, then it is probably not a good idea to be in a high performance mode. There are times where you want to get over a training range or you want to get over weather. Visual flight rules [VFR], it is applicable and usable, but we do not normally do that very often. But in this case, where he knew he was going to go into the goo, it was probably a bad decision, in my opinion.

Admiral JOHNSON. Yes, sir.

Captain SNODGRASS. Absolutely.

Mr. HUNTER. Duke, you say the bad decision was to not go to his instrument panel or his vertical display?

Mr. CUNNINGHAM. No. It is hard to describe. You are really in a battle with yourself, believing your instruments versus what your body is feeling is going on in the airplane. Even in VFR sometimes, you get that feeling with your semi-circular canals. To believe your instruments and tell your body, no, that is not what is happening, exacerbated by being IFR—if he was VFR, I have no doubt that that would not have happened.

But in the clouds, in the clag, the bad decision was doing a high-performance takeoff beyond the 45 degrees in the first place. But then going into the goo, knowing that you are going to have to level off in the goo—if he was going to top out above it—say you have a 1,000-foot overcast and you were going to pop out over the top of this stuff, it is just like your brain goes in syncs and your gyro cages, and Pete has gone through the same thing, and I think there would have been no problem.

But in the time when you are in an area here where your IFR and have to do that, like I said, you are feeling like you are doing this and you are pushing on that stick trying to get level when you are actually here.

This young man came out of the clag about 2,200, 2,300 feet going straight down, full afterburner, and then saw the problem that he had, because at that moment, I am sure his gyros caged in his mind and he went, I know I cannot make it, and he tried to and impacted the ground.

Admiral JOHNSON. Yes, sir. I think the time span here is important to remember, too. We are talking about essentially, from the start of the takeoff roll to the crash, about a minute.

Mr. CUNNINGHAM. And he hit, what, about a mile, mile-and-a-half off the other runway.

Admiral JOHNSON. Exactly. And, in fact, in the critical flight regime that Mr. Cunningham talked about with the nose up, your body lying to you, it would not take much of a distraction inside the cockpit at all to cause your eyes to fall off for 5 to 10 seconds and that is all the time there really was in this flight to translate from nose high to extremely nose low.

Mr. CUNNINGHAM. Mr. Chairman, I think it is important for the committee—the reason I brought it up, I think there is a reason why we have unrestricted climbs at times——

Admiral JOHNSON. Yes.

Mr. CUNNINGHAM [continuing]. And I would hate to see that go away. But I think to eliminate an unrestricted climb where you know that you are going to have to level off, and even if you are doing it right and say that your altitude that you have to level is 5,000 feet in the clag, to do that, even 45 degrees nose up, chances are you are going to do this, which could take you up into other aviation traffic. So you would not want to do that, and I am sure the Navy is going to react to that.

Mr. HUNTER. Mr. Peterson, did you have something?

Mr. PETERSON. I did, a couple things flashed through my mind, just to follow on to what Duke is talking about.

One is that some people are more susceptible to vertigo than others. The health of the individual is a factor, as well. Is there any indication that this individual had a cold or had historically experienced a problem in flight training or at the squadron level or anything like that that would have said that this fellow is more susceptible to vertigo than another person?

Captain SNODGRASS. No. In fact, to almost the opposite. He was, by all definitions, exceptionally healthy. He was very, very health conscious, worked out extensively, lifted weights, so his tolerance to G's and the way he lived his life was about as healthy as you can get. In addition, the post-mortem and the previous 24-hour and 48-hour histories proved that he got more than adequate rest. There was no alcohol or drugs whatsoever in his system. In fact, I think he never even drank at all. So he was, by all standards, very, very healthy and you would no way think that that would be a contributing factor.

Mr. PETERSON. The next thing is that it is incredibly puzzling to me that he came out of burner at even at 45—let us say he is at 45. You have already suggested that he was over that. If he had stayed in burner, he would have popped out, because your tops are at 7,000, is that what you said?

Captain SNODGRASS. Seven thousand to 10,000 feet.

Mr. PETERSON. At that rate of climb and at that angle, you are popping through pretty fast. Can anybody explain to us why he came out of burner?

Captain SNODGRASS. No, sir. We can only postulate. We will never know. I think Admiral Johnson may have touched on it. There might have been something in the cockpit to distract him.

We did notice in the JAG in the subsequent investigation that the air inlet control, the ramp switches were in stow. We have movable ramps on the F–14 that optimize our supersonic capability and prior to takeoff we do in our onboard checks check that symmetry and that movement of those ramps.

The ramps, in fact, were verified that he did a valid on-deck check and that the ramps programmed all the way down to their supersonic position and then back up to what we call the stow position. There is no reason to go back to stow. You just leave it in the normal position, because the power to those ramps is based on your air speed, and before you get to 0.5 mach, there is no power to the ramps whatsoever. At low air speeds, if the ramp did happen to fall, that would cause a stall.

Now in this situation, that did not occur. But what we think possibly might have happened is that he might have gotten what we call an innit light [ph.] which would show a program or potential programmer failure at very high speed and he might have been distracted at that and therefore he might have come back to military power because of that—this is just postulation; we do not know—and then moved the switches to stow, which is at the high-speed end one of the emergency procedures if you have a failure.

But unfortunately, we will never know. There are a lot of questions that we will never know in this tragedy, and that is one of them.

Mr. PETERSON. Then that takes me to the two-man concept.

Captain SNODGRASS. Yes, sir.

Mr. PETERSON. You have two people in there that have kind of backup responsibilities. Having flown the F–4 for a bunch of years and having had my tail salvaged because of that guy in the back, how did you work the scenario as to the other player here? Did he have any opportunity to do anything other than verbal, and would he have had the same experiences? Potentially, but not likely to have exactly the same physiological problems that the pilot experienced.

Had they flown together frequently enough that the back-seat guy could have essentially without reservation suggested that there was an error being made, those kinds of things? Did you look at that in the accident investigation?

Captain SNODGRASS. They were both, obviously, as the investigation proved, fully qualified to go on the mission and fly, so their qualifications were good. As far as crew pairing, they were not a normal crew. In other words, they did not fly routinely together. But it is not uncommon within a squadron, and particularly an F–14 squadron, that you fly with someone other than your normal radar intercept officer or pilot. So it is not something that was overtly out of the ordinary. It was just the fact that they both did not normally fly together.

Responding to your copilot-type questions, their crew coordination, we are at a loss. We do not know whether he could have been yelling at the pilot from the time he rotated in the clouds until the time they came out of the clouds, and maybe the pilot did not respond. Or he might have done nothing. Unfortunately, we will just never know that.

I can tell you that from my perspective, we spend a lot of time, and as we get these tragedies and these accidents, of course, we look introspectively into how we do business. We are reemphasizing once again our crew coordination. In fact, before this incident, I had my crew coordination specialist at the VF–101, which is my training squadron, I sent him to United Airlines because they have the best crew coordination facility and training, in my opinion, and we sent a couple individuals out there to bring back that knowledge. We are working hard.

In this case, I cannot tell you. I can say that physiologically, the physiologists feel that with the negative G push, which was almost three-quarters of a G that lasted for 5 to 8, 10 seconds, and then immediately followed by a 5– to 7–G pull, could potentially have incapacitated what we call G lock of the radar intercept officer. So in the last few seconds, he might have been incapacitated.

Therefore, that would give you—generally, in that situation, the ejection responsibility might normally be the radar interspect officer [RIO] at that point, the command ejection, and if he was incapacitated due to this 6– to 7–G pull after a negative G response for almost an 8–G instantaneous delta in G forces, he might have been incapacitated. The pilot obviously remained with the airplane and conscious, but as a pilot, you know what you are about to do, so you can lead your body in those kind of things physiologically. We postulate that he potentially was incapacitated and therefore that might have been one of the reasons there was not an ejection attempt.

Admiral JOHNSON. There is, Mr. Peterson, one thing that I would add to that and that is that Captain Snodgrass touched on the distraction piece and the fact that he may have been talking to the pilot. We certainly will never know that.

One thing we do know for certain, though, is that this aircraft did not make a departure call, which as you know is normal. Once you are airborne—you are cleared to switch to departure. Once you are airborne, the first thing you do is call that you are airborne, checking in with departure. That call did not take place, so——

Mr. PETERSON. Would they have changed channels, or required to change channels after takeoff to do that?

Admiral JOHNSON. Yes, sir, but the normal procedure is they will do it—as soon as they are cleared to roll, they will switch to departure and do it.

Mr. PETERSON. There were no transmissions?

Admiral JOHNSON. No, sir, there were no transmissions.

Mr. PETERSON. Mathematically, had he not stayed with the 7–G pull, could they have ejected and made it?

Captain SNODGRASS. Based on the profile, you could have ejected up to, I believe, about 1,500 feet or so. I would have to go back and answer that on the record, give you the specifics to draw from. But there were ejection opportunities up until probably 3 or 4 seconds prior to the impact with the ground.

Mr. PETERSON. Does the F–14 have a buddy ejection? Could the back-seater eject——

Captain SNODGRASS. Yes. We have command ejection and the normal procedure is that we fly with command ejection to the RIO, which means that if the RIO ejects, the pilot will go automatically. It takes, from initiation to getting both air crew out of the airplane is 0.9 seconds, so just under a second.

Mr. PETERSON. My last question is that in some of the press reports, there was some indication that this pilot had violated training standards previously that may or may not have been addressed in the process. Is there anything to that?

Admiral JOHNSON. Yes, sir. This pilot was involved in another mishap in April 1995. The investigation of that mishap and the subsequent events that took us to Nashville caused the CNO to reassess how this particular set of circumstances was handled.

What do I mean? I mean the first accident was an engine stall, loss of aircraft. The crew obviously recovered. But in the subsequent investigation, there was some pilot error determined, and subsequent to that, there were a series of things that happened in terms of flying with Mr. Bates that we believe there may have been some necessity to deal with, and essentially nothing happened that we are aware of.

We are looking very carefully at that specific instance, and I would tell you also that the CNO has changed the process by which we do the entire Naval Aviation Evaluation Board to bring visibility on it all the way up to my level as the senior aviator on the Op Nav staff. So I will be working very closely with our air-type commanders, east coast and west coast, in rendering the decisions on all of the aviation evaluation boards.

Mr. HUNTER. If the gentleman will yield on that question——

Mr. PETERSON. Yes.

Mr. HUNTER. Is it your opinion, Admiral Johnson, that the pilot was fit to fly or should have been flying?

Admiral JOHNSON. Yes, sir. Yes, sir. He was fully qualified and fit to fly.

Mr. HUNTER. And that is taken in the context of the past mishap and incidents that you have spoken of?

Admiral JOHNSON. That particular aspect of it, Mr. Chairman, is precisely what we are going to look at and we are going to assess whether we were responsive enough in picking out the indicators that may have been there that would have alerted us to the trouble that ended up in Nashville.

Mr. HUNTER. Captain Snodgrass, what is your personal opinion? Should he have been flying the aircraft?

Captain SNODGRASS. From what I know, yes, I agree with the Vice Chief, that he was qualified to fly. As you go through his case history, and I think you could probably direct the Field Navy Audit Board's questions to the Vice Chief because he has now been directed to be an expert by CNO, but that particular board, of which was given to him after that first accident, was very shallow, and that is pretty much a guarantee.

I think this individual was a very, very good officer, was a great human being, and was a great asset to the squadron, but he was a fairly senior officer but a fairly junior pilot. His performance as a pilot was, though adequate, was never much above average, and he worked very hard at what he did.

As you go through as a commanding officer or an operations officer or a wing commander, every squadron and every individual you have, it is a balancing, just like a football team or a baseball team. Occasionally, we find pilots—we all have done it—they make certain procedural errors, they will make some airmanship errors, and they will make some tactical errors, and it is a question of picking those errors and then training them and keeping them going along.

It is very difficult to say, we should have stopped this individual to fly, and I cannot really say it because I did not know him personally. But there are indicators back there that say that at least in that one accident, his first accident, the FNAB process did not look into his background quite as far as it probably should have. In my opinion, he probably should have been in a probationary status and not relieved of flying but put in a probationary status.

But his particular mentality, to get back to this accident, was one where he was very, exceptionally meticulous in his pre-flight planning, and this particular departure was out of sync with his normal way of doing business. He was known to give extensive briefs and then go fly the mission exactly as briefed. No one could ever recollect him attempting any kind of hot-dog maneuver or any kind of air show-type departure or even requesting an unrestricted departure. So this was kind of out of the ordinary.

And, in fact, if I was the commanding officer, if I had to have faith in a guy to go on a cross-country and not do an air show-type situation, he would probably look like your number one choice. So it was out of character.

Mr. HUNTER. You mentioned the JAG report. Do you have that report?

Captain SNODGRASS. I do not have a copy here, but we can——

Mr. HUNTER. You might summarize for the record with respect to this area what its findings were.

Captain SNODGRASS. Almost exactly what I just told you.

Mr. PETERSON. Mr. Chairman, if I may finish?

Mr. HUNTER. Excuse me. Yes, Mr. Peterson, you may finish up and then Mr. Cunningham has questions.

Mr. PETERSON. Just very quickly, I have great respect for Naval aviators. Throwing yourself in the middle of the night at a moving deck is not my way of having fun.

Captain SNODGRASS. Nor mine.

Mr. PETERSON. I have seen what you all do and it is a very dangerous life, but I want to make a point. Safety cannot be a purely punishable act. You do not create safety in any way or the safety awareness in any way other than through training and just intense almost inculcation process, but it can be done.

The other part of this, though, what I am getting to, is that I am afraid, and perhaps this is true in the Marine Corps, as well, that we may be losing some pilots because the fear of what happens if you do survive after having lost a machine. I want us to talk about that a little bit, if you can, and to suggest, is this a problem or not?

I know that it has always been in the back of individuals' minds and they will delay making the decision to punch out until too late. That is something you cannot have. I do not mind buying—$36 million, I will buy you a new one, but you cannot buy a new pilot. You cannot replace that person. I know that is hard. There is a very thin line here, and commanders have to really tug, trying to make that determination, but I see it as a problem.

I see it as a potential problem in every squadron, that, damn, I do not want to be the next one, and particular now with all of this publicity that you all are getting and the fact that you are here. This is pretty rare, to be talking about the last four accidents in the F–14. This is not usual. I do not want us to place a burden here on the jocks that would be so onerous that they would actually not make the decision to leave a damaged machine.

I think Ike is absolutely right, that this is the psychological part of this equation that may ultimately be your biggest problem after you fix all the other things we have addressed. So I would just kind of like to have your comments on that.

Captain SNODGRASS. Congressman, I think the first part of your question, concerning are we setting up an environment in which aviators will press the test, in other words, press the envelope and not get out of an airplane because they feel they are going to risk undue scrutiny or the pressures of the Field Naval Aviation Evaluation Board [FNAEB] or whatever, I do not believe that is true at all.

I think basically all aviators, particularly those flying pointy-nosed airplanes with afterburners in the strike fighter business, just want to win, and they think they will do everything they can to salvage a situation, whether it be air-to-air combat or putting a bomb on target or getting an airplane out of a difficult situation. So the basic mentality is to solve the problem and win that particular little situation.

But based on this accident and some other things, some other accidents that have occurred in other communities, both in and out of the Navy, we are re-looking very closely and training to something that I really, as I grew up—we thought about ejections, et cetera, and we set up these crew coordination things. OK, in this situation, you have control. In this one, I will tell you if I can fly it or not.

We have always done that, but we are now really, I think, analyzing the ejection decision process, which is—in other words, look at things like we do in dive angles and look how we attack a target, in other words, with the same level of scrutiny. If you find yourself in this situation, you have to eject. If you are pointed at the ground at 500 knots and you are at 43 degrees dive angle and you are going through 780 feet, you need to know that and eject.

So we are looking at it systematically and analytically and bringing up that overall awareness. But I think the first part is that the pilots do not fear scrutiny or what the system will do subsequent to the ejection when it gets down to that point. I do not think that comes into anybody's mind or came into Stacy Bates' mind when he came through the clouds. He just wanted to get the airplane level and climbing and then he will deal with what happened afterwards.

I have been trying, and I think this is something that is occurring, and, frankly, these accidents have brought it to the forefront, what we have been doing with the F–14 community as far as transferring it from a pure fighter to the strike fighter and I think we will wind up almost, as I call it, fixed wing flighter attack, [VAF] or 70 percent strike and 30 percent air-to-air, and that is that we have only a limited number of airplanes and it is what I call a national asset mentality.

So when you get there, you need to do the risk analysis of the mission, et cetera, et cetera, so you fly the airplane like it is your own, like you are paying the mortgage on it. But at the end game, when the decision comes, it is not your airplane. You are more important and you get out of the airplane if you have to.

Mr. SKELTON. Would the gentleman yield?

Mr. PETERSON. Absolutely.

Mr. SKELTON. As I understand it, captain, in your reconstruction of what happened, he came out of the clouds. He hit the ground flat, is that correct?

Captain SNODGRASS. Yes, sir.

Mr. SKELTON. Did he attempt to at any time, in your opinion, from the moment he came out of the clouds until impact, attempt to salvage the situation with afterburner?

Captain SNODGRASS. Yes. He had selected afterburner.

Mr. SKELTON. At what point, do you know?

Captain SNODGRASS. I would assume almost as soon as he came out of the clouds, or just as that occurred. When the airplane hit, as I said before, we can guarantee the left engine was staging up through the third stage of afterburner, and though we cannot absolutely guarantee it, we feel very confident that the right engine was at the exact same situation.

Mr. SKELTON. So as far as you are concerned in reconstructing this, from the moment he came out of the clouds, he did all he could?

Captain SNODGRASS. Yes, sir.

Mr. SKELTON. Thank you.

Captain SNODGRASS. And that is where he gained his spatial awareness. He knew where he was at that point.

Mr. PETERSON. Mr. Chairman, I have no more questions. I just want to say that I respect what you all have done. Clearly, you have done a very good job of this. Having been on accident boards myself before, I know that the analysis is as good as it comes. We appreciate your testimony.

Admiral JOHNSON. Thank you.

Mr. HUNTER. Thank you. Mr. Peterson, we appreciate your expertise here at this hearing, as we do Duke's. You gentlemen have a lot of insight that helps us be more effective here.

Duke, did you have some more questions?

Mr. CUNNINGHAM. Yes, and I would like to also relate what Pete has said. I think those are very good questions, especially for the committee.

Let me clarify one thing, though. Where a possibility that I believe could have happened to the back-seater to incapacitate him, and you will find a lot of the times they speak from their own personal experience, and I think that is what Pete and I speak from, too, a lot of us have a lot of flight time.

I have only blacked out in an airplane one time in my life and it was not in a military airplane. It was with a female pilot named Debbie Garry in a pit special. The reason that she did it is that I had never done an inverted negative G loop, which you roll up like this and you are pulling negative G's. When she came out of that, I relaxed—I did not have a G suit on—relaxed in a pull like this and by the nose-down position after coming around on a negative G loop like this, and then all of a sudden she snapped and put positive G on the airplane and did a regular loop. All of that blood flow went down and the next thing I knew is that I woke up unconscious.

If you look at the aspect of what happened in that, you are coming forward. You are basically finishing the back half of a negative loop. Then when he came like this, saw where he was, then all of a sudden put the G on the airplane, it is the same similar situation where the blood flow goes down. It could have potentially incapacitated the back-seater where he could not have ejected.

I think he saw the situation, tried to salvage the situation, and misjudged on how much room he had to make that turn and then hit flat.

Let me go into just a couple other areas, and I want to absolutely emphasize, I am not pointing to Republicans, I am not pointing to Democrats, because in some cases the examples I am going to use involve civilians. I think that when we need to look at why we have accidents and the contributing factors, I think there are some things that have not been said here today that I would like to go through. I would also clarify that each of these by themselves may not cause an accident, but I think in their entirety, they contribute to it, and let me be specific.

First of all, aviation is much like a race car driver, that you know the risk when you get into it. The families are burdened dramatically. The emotional impact of the families does have an impact on the aviator itself, and how comfortable your family is—as a matter of fact, if a pilot is going through a divorce or something, skippers are notified so that they recognize these kinds of signs. They enter that environment knowing what those risks are and their families accept it and they are willing to forego that risk at expense of their own life and of their family's comfort.

But unlike race car, it is not a sport. These kids are willing to do this in the defense of their country. I would say that there are things that really contribute and hurt these pilots as well as their mental well-being. Let me bring up one case in point.

We have a situation currently going right now where a lot of aviators that were involved in Tailhook have been placed on a list and they know—some of them do not even know who they are—that when it comes time for promotion, that they are asked to fly and risk their life and do all of these things, but yet when it comes time for promotion, that they will not get promoted.

We have a case—and this is my personal opinion, you may differ with it—we have, for example, the Blue Angel, Bob Stump, who was chastised and not supported in the Senate by both Republicans and Democrats, and I think that is a travesty. We have another squadron skipper named Zobiac who did not make his command. We have Shifty Pierce, the executive officer [XO] of the *Lincoln*. I want to tell you, when I talk to the aviators, this all reflects. They are willing to go out there, they are willing to charge, and these things affect negatively on these kids.

Let me tell you something else that I think that hurts. Retention is one of the biggest problems that we have, especially when you really come down hard on their aviators, and they say, hey, it is not worth all of this, taking my family through it, the risk, and I am going to get out. You lose valuable people like that and we have all, in the Marine Corps and the Navy, done that. The Shifty Pierce thing and the Bob Stump thing contribute to that.

But when we have things like base realignment and closure [BRAC], that you rip out these families, in some cases where the wives have jobs, their kids are in school, and all of a sudden, bang, you are told to go, again, it affects the aviator's mind on his family. That has been a portion of this.

When things are politicized, like an ashtray that costs too much or something that in my opinion was probably set up by a lack of Congress funding it in the first place in many cases, and I was at Miramar when we lost an admiral because of that case. I know the attitude of the pilots and how down we were at the time, and I know how that affected us. You cannot measure that. It probably did not cost an airplane, but I want to tell you, it was a negative factor on the id of those aviators, and myself included.

I look at the constant harassment that in many cases I feel that is done on naval aviation and on Air Force and Marine Corps, and these kids know that and they feel that every single moment of the day. I want to say that we had a recent instance at Miramar, just 2 weeks ago, admiral, that we fought not to have illegal immigrants, felons, positioned at Miramar because Janet Reno said that 100 percent of the effect was going to be handled by the Department of Justice.

They were there a little over a week. They burned down the place. Our air crew were called, our firefighters who we ask to do

10,000 things and are Federal firefighters, were called off the runway. We had to divert military airplanes. We lost training ranges. We shut down an entire national security base. The civilian ambulances and law enforcement and the military medical and police were called off to handle this riot, which Department of Justice [DOJ] was supposed to take care of, but they only had 14 people. The people that were there were trying, but there were not enough. Now we are told that they are going to put those felons right back into there.

Those kinds of things take away from our readiness, it takes away from security, it takes away from training, and I think they are things that this committee needs to deal with, not just the military, but those things, as well. I could go on and on and on, but I will not in the interest of time.

Mr. HUNTER. If the gentleman would yield, admiral, in your estimation, on a 1 to 10 scale, where is Navy morale, if you will, in the flight community? Do you think that it is lower than where it has been in the past?

Admiral JOHNSON. I would suggest, and I will let Captain Snodgrass give his answer, that right now—if you had asked me that question 2 years ago specific to the Tomcat community, I would have said it is not very good at all. My answer today, on a scale of 1 to 10, would be somewhere around 7, going up. I will let Captain Snodgrass give his and explain why.

Captain SNODGRASS. I think, Congressman Cunningham, that all those issues that you brought up do weigh on the minds of naval aviators and naval aviation. However, I think they weigh more in the potential of the decision to stay in the Navy or get out of the Navy. In other words, they have career implications.

But I am firmly convinced that those issues do not, almost I would bet my life on it, do not enter the cockpit. We train to and have people that are very professional and compartmentalized, particularly in those kinds of issues. If it is a pure family thing, the commanding officers are looking out for that. But political-type pressures and stuff, they are doing what they want to do and they are getting into airplanes and flying airplanes and I think that really does not enter the cockpit. It may——

Mr. CUNNINGHAM. I do not disagree with you, and that is why I said that it applies to retention——

Captain SNODGRASS. Right. Yes, sir.

Mr. CUNNINGHAM [continuing]. And you lose good people.

Captain SNODGRASS. Exactly.

Mr. CUNNINGHAM. That is the direction I was going.

Captain SNODGRASS. As far as the morale issue, I would say in the F–14 community, I would have to divide it a little bit into two pieces. I live in Oceana/Virginia Beach and am gaining command for all the F–14's in the Navy. I think that is a very good idea, not because Oceana is better but we need to single-site community for lots of reasons, if not just inventory control and training efficiencies. But it will bring a synergism of everyone in one place.

The west coast, in my opinion, though I cannot give any specifics, my gut feeling is they have, relative to the east coast, taken the brunt of the things that you have discussed and the fact that they are moving out of a very nice place to live has impacted the families. So maybe their individual morale/family morale is not as good as Oceana.

But from the community as a whole, I think—and I have used this term before—we are seeing a little renaissance here, both in morale and mission effectiveness, in that we are transitioning from a fighter role into the precision strike and strike fighter role.

And with that, 2 years ago, or 1 year-and-a-half ago, we had the same basic F–14 that we have flown for 20 years with very little improvements. A lot have been promised, but for whatever reasons, a lot of it budgetary, we have not seen the long-term improvements in the airplane that we had looked for. But within the last year with a combination of fleet support, the Naval Air Systems and the Op Nav staff, we have put together, I think, a really good—in fact, we call it the road map to the future. The Tomcat is back. Its vestige is in the precision strike world.

So the average guy, or individual, both male and female, pilot and aviator, and maintenance person at Oceana sees specific improvements that are actually on airplanes. A year ago, we finished the flight test, or not the flight test but the rapid prototype development of the Lantern pod and today it is flying with VF–103 and going to cruise. That is a huge warfighting capability jump that the system allowed us to have in a year.

So my point is that the average aviator is getting faith in the system. They see night vision goggles coming. They see us transitioning to a new platform, the F/A–18F. So there is vitality and vibrancy in the community, and with that and with the feeling that when they go on a deployment, they are going to have an airplane that is tactically capable and they are going to transition to an airplane that is all-world tactically capable. So everybody has a future, and with that, I think overall morale is really on an improvement.

Mr. CUNNINGHAM. Do you agree, Captain Snodgrass, that retention has been affected?

Captain SNODGRASS. Yes. We are seeing retention is going down, but it is also—it has affected that, and I have a lot of second-tour pilots and NFO's, particularly the pilots who are getting out of the Navy, but it is also historically we are in a hiring situation with the airlines. In my career, this cycle is the third time. When I was a lieutenant going through the Replacement Air Gap [RAG] as an instructor, I was the first in 34 lieutenants that went back to the fleet.

So this is not—I think there are a lot of forces at work out there. Our business is hard. There is a lot of family separation, long deployments. The cycle has not altered dramatically. In other words, our turnaround cycles and our deployments have not changed much in the last years. CNO has made sure that we stay—our pers tempo, so to speak, is fairly constant.

Mr. CUNNINGHAM. I think the last thing I would ask, Admiral Johnson, I am aware of it, but what has Admiral Boorda done when you are looking at the problems maybe with pilots and FNAB's? Can you explain to the committee what Admiral Boorda has tasked you to do to make sure that that does not happen again, that there is an adequate review?

Admiral JOHNSON. Yes, sir. Last Friday, Admiral Boorda put out a directive that specified about six or seven—seven, I believe—specific actions to be taken to help us look at ourselves and see that the process is sound and look for any improvement areas that we can find.

I have touched on the specifics of Mr. Bates' first FNAB and the chain of events subsequent to that FNAB that took us to Nashville, how the accountability and responsibility was dealt with in that specific case. That is one.

The second one, I alluded to earlier. The Vice CNO—that is me at the moment—will become the senior representative, if you will, the senior decision maker in all aviation evaluation boards. Up until now, that has been vested in either the type commanders in Norfolk and San Diego or in the Chief of Naval Personnel. At the moment, the Chief of Naval Personnel is a submarine officer, a wonderful guy, but the CNO wanted the senior aviator in Washington to be the guy making that decision, so that is going to happen.

In addition to that, we are relooking at the entire FNAB process. What does that mean? It means that every FNAB that happens in the fleet, and as you know, Congressman, they run the gamut of decisions. There are six decisions that can be made, A–1, 2, 3, and 4, and B–1 and 2, and without going through each one of them, it runs the full gamut of essentially just getting back in an airplane to never flying again. All of those aviation evaluation boards will now come to the Vice Chief. Thumbs up or thumbs down, they are coming to the Vice Chief.

The real purpose in doing that is to get inside ourselves and get force-wide visibility on this whole process just to make sure, and I personally believe that the process is very sound. It is not perfect, but it is very, very sound. But we want to make sure that if there are marginal changes or even substantive changes that we need to make that we will do it in a very prompt manner. That is why bringing the visibility to the Vice Chief and having a macro-look at the whole process will be very helpful for everyone.

In addition to that, we are going to specifically look at the Field Naval Aviation Evaluation Boards that have been conducted in Air Wing 11, which is where Lieutenant Commander Bates was attached, since 1993, just to make sure that we are square within our own process there.

The Naval Safety Center has been tasked to look, and this, Mr. Peterson, gets back to your point, I think, to look at how we might do a better job with predictors and get into better risk management, and that gets into ejection decisions and things like that, to try to put some more metrics around it so that we really frame it so that everybody is dealing from the same deck in terms of how we ask ourselves these process questions.

In addition, it was touched on earlier, we are going to mandate that the CO and the executive officer of each aviation squadron attend the Aviation Safety School. I would tell you that over the years, that has been honestly hit or miss. If it worked out in your pipeline training, you went. I personally never got to go. We are going to make it happen for everybody. That is a done deal.

And the last point is that we have terminated the NFO-to-pilot program. We felt that there was marginal return on that in the long run. We have about 97 of them in the fleet right now. Most of them are good aviators, but the return on investment is, as I say, marginalized for us and the CNO has terminated that program.

Mr. HUNTER. Let me ask a question about that, since you mentioned that.

Admiral JOHNSON. Yes, sir.

Mr. HUNTER. That is a program where a back-seater, if you will, can become the pilot?

Admiral JOHNSON. Yes, sir, that is correct.

Mr. HUNTER. As a nonaviator, it makes some sense that a person who understands the business at least from the back seat of the cockpit would have an affinity for navigating that airplane, for being the pilot. Why is that not a payoff?

Admiral JOHNSON. I will give you my opinion, Mr. Chairman, and then ask Captain Snodgrass to give you his. I would tell you that my experience with NFO-to-pilot, both from a fleet F–14 command perspective and from a Bureau of Naval Personnel perspective, is that the pilot—what you say is a fundamental entering argument, that says, hey, they have situational awareness. They know the airplane. They know the tactics. It makes all the sense in the world.

Mr. HUNTER. They have the ability to pilot the aircraft, do they not, in some cases?

Admiral JOHNSON. No, sir.

Mr. HUNTER. They have no control over it?

Admiral JOHNSON. No, sir; the F–14 has no back seat controls at all.

Mr. HUNTER. So if a pilot is hit by groundfire, for example, the lead pilot, you both go out?

Admiral JOHNSON. Yes, sir; that is why we have back seat command eject. Yes, sir.

Mr. HUNTER. So the one thing he can do, he cannot pilot it but he can make sure they both get out of there?

Admiral JOHNSON. That is absolutely right.

Mr. HUNTER. OK.

Admiral JOHNSON. But the truth of it is, if I go through as an NFO, as a radar intercept officer in F–14's, and I go to my fleet squadron and I do good things and I then want to become a pilot, I am now a senior lieutenant. I come back into the training command, essentially starting the pilot training command from day one, which is the correct thing to do, all the way through, get my wings, go to an FRS, a fleet readiness squadron. Now I am in the front seat instead of the back seat. But in truth, what I have done is I have come back now as a senior lieutenant or a lieutenant commander, so I am wearing 2½ stripes but I am as nugget as they come in terms of being a pilot. Frankly, it does not work consistently enough or well enough where we think it is——

Mr. HUNTER. That is a very important point, because one part of the record that I have here indicates that on several occasions with respect to Lieutenant Commander Bates, his back-seaters indicated that they did not want to fly with him thereafter.

Admiral JOHNSON. Yes, sir.

Mr. HUNTER. That he, at least in their estimation at times, did some things that were marginal. Implicit in what you are telling me is that because the back-seater-turned-front-seater has some rank, it is a little bit more difficult in the diplomacy, if you will, of Naval operations to deny a higher-ranking officer the right to continue to fly than perhaps if he is a junior officer. Is that what you are getting at?

Admiral JOHNSON. No, sir.

Mr. HUNTER. I am trying to understand what you are saying.

Admiral JOHNSON. If I did that, I did not mean to cast that picture for you, because I really do not think that——

Mr. HUNTER. Let me ask it this way, and let me just review this. Duke, if I can just get you to yield for a second.

Following the flap incident—I am reading this report—Commander Killian, an operations officer, decided to fly only senior, experienced RIO's with Lieutenant Commander Bates and felt that a RIO more senior to Lieutenant Crawford was necessary.

Mr. CUNNINGHAM. Would the gentleman yield?

Mr. HUNTER. Following Lieutenant Commander Bates' postmishap return to full flight status, a RIO in VF–213 who had flown with Lieutenant Commander Bates approximately 20 times told the Operations Officer (OPSO) that he no longer wanted to fly with him. He ultimately based his request upon difficulties Lieutenant Commander Bates had in rendezvousing with the tanker and another airborne decision which failed to reflect safety of flight consideration. "I would go med down before I would fly with him again. I feel unsafe."

Mr. CUNNINGHAM. Would the gentleman yield?

Mr. HUNTER. Sure. I would be happy to yield.

Mr. CUNNINGHAM. I think the point is that you put a more senior back-seater—just like the first time I ever went to Vietnam, they put a senior back-seater that had the experience in my back seat, and then a pilot that had experience, they would put a junior back-seater in his pilot because he already had the experience.

A senior pilot would have more command over that guy, the front-seater, and also the experience, second, is what the admiral is saying, is that when you take a—we call them retreads, an NFO-to-front-seat, by the time he becomes a pilot, he does not have all the experience of flying up to that point that someone that has gone through the entire pilot syllabus.

So when he is here as a pilot, he is actually down here as far as skill level and everything as an actual pilot. He has the situation awareness, but the physical skills, the JO that has gone all the way through the program has more skill, but yet he is asked to have the position of responsibility of flight lead, the division leader, and everything else, which in most cases does not measure up.

Admiral JOHNSON. Yes, sir. Well said. It is not a rank thing per se, it is an experience thing.

Mr. HUNTER. I understand. Go ahead, Pete.

Mr. PETERSON. There is a reality here that the Navy has *x*-number of flying slots available, training slots. Through the pipeline, you cannot even come close to meeting all of those people coming out of the academy and through the other programs that want to go into that training.

Admiral JOHNSON. Yes, sir.

Mr. PETERSON. So what you are doing is you are training someone into a pilot billet that you are not going to have for a full career. He has already used up part of his career. It skews the whole system to some degree and it does become a scheduling problem, an assignment problem.

Admiral JOHNSON. Yes, sir.

Mr. PETERSON. All pilots are not created equal. You end up having to make assignments based on those skill factors, not on rank, and sometimes you really can unbalance a unit by bringing in a higher-ranking but a lesser-skill. If you have a pipeline that is already packed full that you cannot really take advantage of the real talent that is coming down that pipeline, it really does not make a great deal of sense to take someone out of the back seat and then put them in the front seat.

Mr. HUNTER. Ike, did you have anything?

Mr. SKELTON. Yes, very quickly. Admiral Johnson, is it not true that the F–14 was primarily designed as an air-to-air airplane?

Admiral JOHNSON. Yes, sir.

Mr. SKELTON. Was the mission changed to include air-to-ground?

Admiral JOHNSON. Yes, sir; in actual fact, Mr. Skelton, I think originally the F–14 was designed to do both things. The way it got translated in our younger days was as an air superiority fighter, but now, because of the initiatives specific to the Lantern pod, it will be what I consider to be a substantial and significant air-to-ground force multiplier for us.

Mr. SKELTON. Has this change in emphasis on the mission affected the training or naval operations?

Admiral JOHNSON. My answer to that, Mr. Skelton, right now, would be no, sir. But as I indicated in my prepared remarks, it is something that we are very sensitive to, and I will let Captain Snodgrass address it if he wishes. But because it is a rather fundamental change to the way the community is trained and employed, actually, we are watching carefully to make sure that we do not either overextend ourselves or misalign ourselves in the training.

Dale, do you want to respond?

Mr. SKELTON. Let me ask this, and then, Captain, you answer this, as well. Put the F/A–18E into the mix. Will it be better suited toward these missions that we spoke of a moment ago than the F–14?

Admiral JOHNSON. The F/A–18E and F/A–18F, in the particular case of the F–14 transitioning to the F, that is the plan, as you know. I will let Captain Snodgrass talk you through that, if you want to, Dale.

Captain SNODGRASS. Yes, sir. Absolutely. Right now, I coin the F–14 as the strike fighter bridge to the F/A–18F, and what we are doing is systematically adding warfighting capability in the precision strike world and specifically Lantern and training to that environment to take us to the point where we can transition to the F/A–18F. So I think we are doing—the system has done a very nice job of providing that capability both to the air wing commanders and the battle fleet commanders and also the theater CINC's, and it will do, particularly in the precision strike, laser-guided precision strike world, it will be an exceptional platform and will blend nicely as we transition.

As far as the training piece, it is, I think, an exceptionally good question to ask. Do I have the ability with the flight hours I have and the limitations I have with the airplane to be able to adequately train air-to-air capability and air-to-ground capability? I will say currently that we are absolutely capable of doing that with the flight hour funding that I am seeing right now.

Historically, we trained exclusively air-to-air, but that air-to-air training was not just specific fighter-to-fighter air combat. We also spent a lot of time on fleet air defense and going out and doing air intercept missions, et cetera. Right now, essentially a lot of that flight time that we did in that fleet air defense, air intercept mission-type training has now been transitioned over to air-to-ground.

We are also doing our training, I think, a little bit better now. We are looking at how we train so we are optimizing our individual flight training, in my opinion, significantly more than we used to when I was growing up. When I think a lot of us who flew fighters in the old days, we would get an airplane and we would have a full bag of gas and three airplanes and it would say [AIC], or air intercept control, and that meant we would go out and do ten intercepts, of which we would do every other day. So we got very good at that, but there was not a lot of real tactical application.

Today, the junior officers that are going through flight training on the F–14 spend essentially half their time learning the air-to-ground business or strike business and the other half in the air-to-air business, and I have been through my fleet squadrons in my tour, we call it strike fighter Air Combat Maneuvering [ACM] readiness program, which is a very dedicated individual unit-level training in which half of it is air-to-air and half of it is air-to-ground. I have not seen any degradation in performance of the air-to-air mission and have seen some exceptional work in the air-to-ground. So I think right now we are handling that training program very well.

We have yet to introduce the Lantern and the precision strike, but having flown that system, from the pilot skill level, it is fairly simple to fly and to employ the weapons that that brings with it. So I think we are on the right track.

Mr. HUNTER. If there are not any other questions on this specific—oh, Pete, do you have one? Mr. Longley, I think, has a question.

Mr. PETERSON. Mine is very brief. We just have not, I do not think, discussed adequately the afterburner of the F–14. You have shut down use of the F–14 afterburner on the B's and D's, right?

Admiral JOHNSON. Yes, sir.

Mr. PETERSON. Tell us something about this burner. What have you discovered that makes this airplane so vulnerable to the use of that very valuable asset except in an emergency? Then what is the difference between it and the A-model burner that makes it different?

Admiral JOHNSON. That will transition us into the discussion of the F–14D accident.

Mr. HUNTER. Pete, why do we not lead off with that when we go to the other accidents, because Nashville involved an A.

Admiral JOHNSON. Yes, sir.

Mr. HUNTER. Ladies and gentlemen, why do we not take a 5-minute break here and we will come right back and we have the other incidents to walk through. You have covered a lot of the general areas we wanted to cover with this first one, so I think it is appropriate we took the time that we did.

Wait, Mr. Longley, I think, had a question. Go ahead, Jim. You have not had a chance yet.

Mr. LONGLEY. Thank you, Mr. Chairman. I appreciate the opportunity to ask a question now and make some comments because my comments pertain particularly to the Nashville incident.

I just want to begin by saying that shortly after the accident, I had the opportunity to speak with the parents of the radar intercept officer, Lieutenant Higgins, and I would just convey to the committee and to the Navy the tremendous pride that they felt in their son and in the pilot and particularly the tremendous pride that they knew that their son and his pilot shared in what they did, the very difficult and dangerous work that they did. They were very appreciative of the Navy's response and interest and care and concern at that time, and I just want to reflect that to the committee.

But I would also like to pick up on one or two of the themes that have been developing and particularly ask a couple of questions. First, did the review involve any evaluation or examination of the pace or the extent of training hours or flight hours? Were there any anomalies in that area? Had they been consistently flying the scheduled hours that they should have been flying?

Admiral JOHNSON. Yes, sir. The short answer is yes, that was considered. No, there were no anomalies and the air crew was perfectly qualified to fly the mission in that context.

Mr. LONGLEY. And the aircraft was, again, in good shape?

Admiral JOHNSON. Yes, sir.

Mr. LONGLEY. Well maintained?

Admiral JOHNSON. Yes, sir.

Mr. LONGLEY. There has been some discussion earlier about the implementation of the digital flight control system for the F–14 and also the remanufacturing program for the AV–8B. I would just for the record ask if there is any correlation that can be made between the adoption of these systems and not necessarily accidents such as the unfortunate one we are discussing today but the general trend of accidents.

I would be interested to determine the extent to which implementation or enhancing the implementation of these systems would have a demonstrable impact in terms of lowering the accident rates that we might expect. I realize that goes a little bit beyond the pale of the current situation, but it is very clear to me, particularly, General Blot, as you discussed the remanufacturing program and the decline in the accident rate attributable to the improvements that were brought into the aircraft, that there is a very clear cost-benefit curve that we should be taking a look at in terms of potential savings, not just in dollars but certainly in the lives and careers of the men and women involved. If you could, if there is some information available on that, I would be very interested in seeing it.

Finally, with respect to the vertigo that a pilot would experience, and again, I would defer to my two colleagues who have far more time in the cockpit than I have ever dreamed of, is there an issue here with instrument design? Could you discuss for a minute the problem that a pilot experiencing vertigo might experience and/or problems potentially in reading the instruments?

I guess what is prompting the question is, as I understand, for instance, an altimeter will generally spin rather quickly when you are going up. I am just wondering, would it obviously spin in a reverse direction going down, and is there a design problem attributable to the fact that if you are doing 15 things and you are traveling at the speed you are traveling at and the instruments are spinning one way or the other, that it may not be readily evident whether you are going up or coming down, again, in a vertigo situation in a cloud cover, or is that an issue that has been looked at or evaluated in the past?

Admiral JOHNSON. Let me take the first one, if I could, Mr. Longley. You mentioned the digital flight control system. We are going to talk about that some more, but let me just encapsulate it briefly.

The digital flight control system and the engine breather modification that we will talk about as we get into these other two mishaps we believe will have significant impact on the safety of the F–14 force. To the degree that—I will just give you a number, and it is kind of my number—I would suggest that maybe as much as one-third reduction in the accident rate based on the number of out-of-control flight accidents that we have had, 35 over the history of the Tomcat, what we think the digital flight control system, what we know of it so far, and Captain Snodgrass has flown it, so he can describe that in some detail later if you would like. But I would suggest that those two changes alone will have a significant impact on the safety record of the F–14.

Mr. LONGLEY. Thank you. Any other comments?

Admiral COOK. As far as the flight instruments are concerned, Congressman, we do not get a significant number of reports back from the fleet saying that they are inadequate. In fact, the example you used of the spinning altimeters taken in and of itself could look like it may be a confusing factor, but in my experience, and I am an F–14 pilot, as well, not as much time as my two colleagues, but I always remember that when you get into a bind or you get confused, you simply take care of the basics.

In this case, you would set the attitude of the airplane via the principal attitude control indicator, the VDI that Captain Snodgrass mentioned, and you would set the power setting about where you would want it and you would fly the airplane out and not let yourself get distracted by certain instruments that may be unwinding one way or the other.

Admiral JOHNSON. But I would also add, Mr. Longley, that your point is well taken. In this business of, OK, if you know about it and if everybody has had the sensation when you go into the clouds, maybe in this day and age of new technology there is a better way to deal with that.

That is a very valid point and one which this mishap highlighted for us and we are going to look at that. I do not know what that means yet, but we have a lot of smart people around who can get energized to look at that and we have it for action.

Admiral COOK. There are some Research and Development [R&D] efforts on the table that involve advanced flight equipment and so forth that start to apply artificial pressures to different parts of your body, tactical sensors and what not, to help a pilot cope in a very demanding environment such as this. So in terms of R&D projects that are out there to exploit, as the Vice Chief mentioned, there are some that we are looking at.

Mr. LONGLEY. Mr. Chairman, again, it is with a heavy heart that we conduct a hearing such as this, but I want to compliment the Navy for being forthcoming and we are definitely trying to do what we can to respect the memory of these brave men and women. Thank you.

Mr. HUNTER. I thank the gentleman. I think his point is well taken. It is sometimes too easy to sit in judgment, if you will, over actions that were taken by aviators that very few of us, I know with the exception of our great aviators who are on this panel, could ever dream of doing.

I am reminded of the passage in "The Bridges of Toko Ri", the great James Michener book, in which the captain of the flight operations after the hero has failed to return from this last strike on the bridges of Toko Ri and he wonders aloud where we get people who can fly off these carrier decks and hit a target and come back to that little floating postage stamp in the ocean that we call a carrier. Having watched carrier operations, I think it is a miracle every time they launch.

Certainly also with respect to the fact that sometimes aviators do things that are not according to the book, sometimes you define that as initiative and it is that initiative that makes us prevail in war many times. I know that the celebrated Mr. Cunningham has come in a little bit low at times over the deck at Miramar. He told me he one time had the CO drive out to meet him personally with greetings after he had——

Mr. CUNNINGHAM. Thanks a lot.

Mr. HUNTER. I am here to help.

Admiral JOHNSON. I find that hard to believe, Mr. Chairman. I really do.

Mr. HUNTER. I promise, I will never tell about the raccoon incident. This is certainly not intended to be any type of a tribunal in judgment of the individuals who flew this aircraft. We have a lot of respect for them. We have respect for your professionalism. You have worked this pretty thoroughly. At least, I am impressed with the thoroughness and the professionalism of this investigation.

We have these other incidents we need to go over and we are going to stay here until we get every last thing nailed down, so why do we not take 5 minutes and we will start up fresh with the next mishap.

[Recess.]

Mr. HUNTER. We will resume and take up the discussion of the other mishaps. Admiral Johnson, I will let you walk us through those at your own pace.

Admiral JOHNSON. Thank you, Mr. Chairman. What I would like to do, sir, is transition to the second mishap, which is the F–14D.

This will get at what Mr. Peterson was asking a short time ago regarding the afterburner.

You will recall that this happened off U.S.S. *Carl Vinson* in the southern California operating area, February 18, VF–11. To put it simply, it was a high-speed low pass on a surface combatant as part of a tracking exercise for that surface combatant, and in the course of that high-speed low pass, something happened to the airplane and it catastrophically destroyed itself in flight. We believe there was no apparent ejection attempt and we lost, regrettably, both crewmen.

We have recovered significant portions of that aircraft, to include the engines, and that is the basis for our investigation right now, or the centerpiece of our investigation right now. You know this is the F110, not the TF30 that the F–14A has. These are resident in our F–14B's, of which we have 81, and our D's, of which we have 50. So it is an F110 engine, which is the core engine for the F–16's, F–15E and F's, and, of course, our Tomcat B's and D's.

I think probably what I should do with that now is ask Admiral Cook, who is our NAVAIR air expert, to describe for you a little bit about what we think we know now, and I hasten to point out that the investigation is still ongoing, but we have some indicators and that is what brought us to the restrictions and I think I will turn it over to you, Jeff.

Admiral COOK. Thank you, sir.

Mr. Peterson, as you probably know, the F110 engine that we use in our F–14's is a variant of an Air Force engine. We made some modifications to it for F–14 use, not the least of which was lengthening the afterburner section.

So in our early experience with the 110, we had some difficulties with the afterburner section. We were seeing high incidences of hot spots in what we call the afterburner liner and that led us to make a modification, a substantial modification, to the afterburner [AB] section. We changed the orientation of the fuel spray bars and we changed the forward section of the AB liner to introduce a more favorable cooling air pattern, cooling hole air pattern, and changed the corrugations on the AB liner.

Unfortunately, before all those changes went in, we did have a class A mishap due to an afterburner liner burn-through, but once those changes were introduced into our 110's, we continued periodic inspections and we have not seen any evidence of that particular problem recurring.

That brings us up to the engineering investigation on the 110s that we retrieved from the accident in question. That engineering investigation is nearing completion and it is drawing our attention to the afterburner section, probably more accurately what we call the aft turbine section. But from all indications, it is a very different problem than the one we experienced early on.

I have to emphasize that this is preliminary information. The investigating engineers, they are not to the point where they can put their name to the investigation yet. But what we are seeing is evidence of an oil leak in what we call a turbine strut frame, which is in the aft section of the turbine, and we think there is an oil migration path that gets atomized oil in a section of the engine where the flames from the afterburner can move forward and cause the type of situation that perhaps happened on this particular mishap.

But again, we are probably 1 week to 10 days away from seeing this in writing and it could change. This is preliminary.

Mr. PETERSON. Did that airplane explode? Is that your preliminary observation?

Admiral COOK. My colleagues may want to amplify it, but what I understand, sir, is there was evidence of fire from the starboard engine. There was an explosion. It may have been immediately prior to impact or coincident with impact. I am not sure they have sorted that out for sure.

Admiral JOHNSON. That is absolutely correct, sir, and I may have misled you before. But, in fact, there is some conflicting eyewitness accounting as to whether or not it was a controlled flight into the water after that explosion or whether the airplane exploded in the air, and that is part of the investigation right now.

Mr. PETERSON. Mr. Chairman, may I proceed?

Mr. HUNTER. Yes.

Mr. PETERSON. The high-speed run was in full afterburner, true?

Admiral JOHNSON. I do not——

Mr. PETERSON. For how long had he been in afterburner at that time, no idea?

Admiral JOHNSON. Five minutes full AB, yes, sir.

Mr. PETERSON. So it was a long burn, then?

Admiral JOHNSON. Yes, sir.

Mr. PETERSON. From what you are saying, that oil accumulation would come only after a long burn, or a short burn? Normally, you would not use a burner for five minutes.

Admiral COOK. I do not know the answer to that, sir.

Mr. PETERSON. You do not have that?

Admiral JOHNSON. We do not know that yet.

Admiral COOK. We do not know that yet.

Mr. PETERSON. Of course, he was not going into afterburner, he had already been in it. Is there any PIO that is accompanying an afterburner engagement in the F–14? Is there any control change that would——

Admiral JOHNSON. Dale? None that I am aware of.

Captain SNODGRASS. From the pilot's standpoint, afterburner use, particularly in the transonic or supersonic regime, it does not induce any pilot oscillations or aircraft oscillations. The airplane is very well designed to go transonic and supersonic with its wing-sweep design and with the inlets, so it is a very nice airplane to fly in that regime.

Mr. PETERSON. And the afterburner has the five stages, so it is kind of a smooth——

Captain SNODGRASS. The F110 engine does not have five stages. It is more of a continual stage, so it is a higher technology engine. You select percentages. Your throttle actually moves percentages of afterburner.

Admiral JOHNSON. But the specific answer to your question, Mr. Peterson, in terms of this mishap, is there any belief that it was pilot induced oscillations [PIO]-induced to go into the water, the answer is no, as we know it now.

Mr. PETERSON. What altitude was he?

Captain SNODGRASS. Five hundred feet.

Admiral JOHNSON. Five hundred feet, I believe.

Mr. PETERSON. And what speed?

Admiral JOHNSON. Transonic, as I understand, is that right?

Captain SNODGRASS. He was more about 1.2-indicated mach or something in excess of 700 knots.

Mr. HUNTER. If the gentleman will yield, this was a missile simulation? The aircraft was simulating a target for the ships?

Admiral JOHNSON. Yes, sir.

Captain SNODGRASS. Yes, it was.

Mr. PETERSON. So you have pretty well established we are talking an engineering, a burnthrough or something of that nature, or a burnup, I guess, forward into the engine case?

Admiral JOHNSON. Yes, sir. At this stage of the game, we are very confident that the problem is in the afterburner and that the fix that we have put out to restrict afterburner usage to emergency only for the B's and D's will keep us out of the threat ring, if you will, until such time as we can get an engineering change.

Mr. PETERSON. I guess I go back to my original point. Have you had any indication of any kind of problem like that with that engine, that afterburner combination, with a normal short-burn operation? Running an afterburner 5 minutes is quite a while. You are punching out a lot of gas out of it.

Admiral JOHNSON. Yes, sir.

Mr. PETERSON. So you are not running afterburners very long.

Admiral JOHNSON. I am aware of no short excursion problems in that regard, no, sir.

Mr. HUNTER. To expand his question, have you ever had that particular problem with the afterburner before, before this?

Admiral JOHNSON. No, sir.

Mr. HUNTER. But you are quite certain that is what this is?

Mr. PETERSON. If I may, you mentioned a burnthrough at one other point in another engine.

Admiral JOHNSON. You had a burnthrough on an earlier accident.

Admiral COOK. Yes. Yes.

Mr. PETERSON. And that was the same engine combination?

Admiral COOK. It was an F110, yes, sir.

Mr. PETERSON. Maybe you ought to talk to us about that incident.

Admiral COOK. Mr. Peterson, I do not have the precise details on that one. That was a while ago. I would have to take that for the record.

Captain SNODGRASS. There were, as I am aware, two other incidents where we lost a F–14B or a D. One was a D on the west coast, VF–11, similar kind of profile, low-altitude, supersonic. That airplane was not recovered because it was in very deep water.

The other incident was in VF–101, an F–14B on the east coast, and that was extended afterburner use, supersonic at medium altitude with a catastrophic engine fire, and out of that investigation came the afterburner liner fixes to the airplane which Admiral Cook discussed before.

The incident that we are talking about today, though it occurred in the same basic region of the engine, appears to be caused for different reasons. As I said, the engineering investigation will determine exactly what it is that we think—we have a good grip around it.

Mr. PETERSON. Thank you, Mr. Chairman.

Mr. HUNTER. Let us go ahead. You have one last incident that you want to talk about?

Admiral JOHNSON. Yes, sir. This incident occurred 4 days after the one we just described over in the Arabian Gulf off U.S.S. *Nimitz.* This incident or mishap is also still being investigated, but I must say at the start that one of the reasons we feel fairly confident that we know where this investigation is going is because we got the aircrew back and the pilot has been very forthcoming and very helpful in describing the circumstances that he got himself into, and frankly just admitted to us that he made a mistake, which is to his great credit, in my opinion.

Bottom line, he was on a functional check flight after a right engine replacement, which is the standard thing that you do. You go up and test various data points to make sure the engine reinstallation is correct. In the course of doing the functional check flight procedures, he got himself into a situation which I will let Captain Snodgrass describe, if you like, wherein at 25,000 feet, about 0.7 mach, he was checking out something we call mid-compression bypass logic and in so doing he used an incorrect procedure and essentially got the airplane stalled and spun the airplane and ejected the crew at 10,000 feet.

The procedure that he used is an old procedure wherein you essentially bunt the nose to test it. The new correct procedure is to roll inverted and push the nose, and Dale, if you want to amplify that, you can.

But nonetheless, the point is, we believe it to be a fairly—straightforward is probably not the right way to say it, but it was a pilot error mishap, thanks to the honesty and integrity of the pilot, sharing all of that with us.

We are in the process of salvaging that aircraft, however, because frankly, there was some concern as to whether or not perhaps the pilot did not get helped by the flight controls enough to get him out of the situation. So just to make sure we know what we are dealing with, we are going to salvage that aircraft and that process is underway right now, sir.

I would add, if I could, Mr. Chairman, that I touched on it earlier. I think one of the things that we need to share with the subcommittee is because of the out-of-control flight mishaps that have occurred over the history of the Tomcat, I mentioned the digital flight control system before. I would tell you that the digital flight control system will fix exactly what happened in this mishap.

There are significant ramifications, we believe, in terms of enhancing the safety, as I mentioned in my prepared remarks, in the edge-of-the-envelope operations. That digital flight control system is going to replace the roll, yaw, and pitch computers in the airplane with digitized computers. The whole change is paid for. It is on line. It is coming with GEC Marconi. So we are going to refit all of the B's and D's and the A's that will be here so that we will eliminate that as a causal factor from future mishaps.

Mr. HUNTER. While you are on that, Admiral Johnson, the two major changes you are making with respect to machinery are the digital flight control and the engine breather modification.

Admiral JOHNSON. Yes, sir.

Mr. HUNTER. You have that obviously planned and budgeted, and so we are going to see that reflected in this year's budget.

Admiral JOHNSON. Yes, sir.

Mr. HUNTER. What are we doing in this year's budget—I do not have the plan in front of me—what are we doing in this year's budget to implement the digital flight control modifications?

Admiral JOHNSON. We have $9.6 million in the 1996 budget to do it and $30.4, I believe, is the correct number for 1997, sir, for a total buyout of $80 million. That process will commence—it is commencing now, although they will not first go into airplanes until the testing is done. So this process will take us through to about 1999, I believe.

Mr. HUNTER. Is there a way to accelerate that program?

Admiral JOHNSON. My answer to you today, sir, is no, but not because nobody is trying. There is an incentive piece in that GEC Marconi contract that tries to bring it forward as we can, but we want to make sure that we have it exactly right. Everybody is working to bring it sooner, but the answer is right now that the timeline we are on is right.

Mr. HUNTER. Pete, do you have anything else on these? Captain Snodgrass, did you have any additional remarks you wanted to make on this third mishap?

Captain SNODGRASS. No. I could describe the maneuvers of the airplane that was lost in the Persian Gulf in a little more detail, if you so desire, but it was basically a procedural error on the part of the pilot.

Mr. HUNTER. And the pilot has been thoroughly briefed on that?

Captain SNODGRASS. It is right in the checklist. As you do these functional check flights, you go out with, it is about a 20-page checklist and you go through each maneuver and you mark it off, complete or incomplete, and right there it says when you get to this portion of the checklist, you execute it in this manner. You should also brief it prior to going, which he did. In fact, in the brief, I believe he said, I am going to go do it this way as opposed to the way it was supposed to be done, and he also did it at a high gross weight, which had a significant factor in the eventual departure of the airplane and subsequent out-of-control loss.

Mr. HUNTER. Is there going to be any disciplinary procedure as a result of that?

Admiral JOHNSON. We do not know the answer to that yet, Mr. Hunter. That investigation is still ongoing. But I would tell you that the fact that the pilot came forward in such a positive way and shared his mistakes will be a significant factor in his determination.

Mr. HUNTER. And let me make it clear again, too, that this is not a tribunal sitting in judgment of your pilots.

Admiral JOHNSON. No, sir.

Mr. HUNTER. In fact, I think that there is a great value in learning from experience.

Admiral JOHNSON. Yes, sir.

Mr. HUNTER. I think that the worst thing we can do is become a chilling factor with respect to the Navy to the point where people are basically afraid to do anything innovative because they think that that is going to be it, or be the end, because Congress is watching every action extremely closely. I think there is a certain amount of experience that people—I think everybody who flies these great machines makes some mistakes, certainly some of them smaller and some of them bigger, and happily, most of them survivable, and that makes them better pilots.

So certainly, take no implication from this committee that we are making any recommendations with respect to personnel actions. You know that a lot better than we do.

Admiral JOHNSON. Yes, sir.

Mr. PETERSON. Mr. Chairman.

Mr. HUNTER. Mr. Peterson.

Mr. PETERSON. I would just add that it takes a mighty big pilot to step up and admit an error. There were a lot of times that I had things that I regret right now, actually, running ground crews through all sorts of checks that clearly probably were my error, if I were to admit it, though hindsight is very good. For someone to come forward like this is not a small event in that individual's life.

Admiral JOHNSON. Yes, sir.

Mr. PETERSON. I would also ask, if you could, tell us when we might hear what your final would be of the west coast afterburner accident, or if it is afterburner.

Admiral JOHNSON. We expect, sir—I think the day that I recall is April 20, but the point is it will be within the next couple of weeks, I think.

Admiral COOK. Yes, sir.

Admiral JOHNSON. The engineering investigation is just about complete, not quite. As soon as it is, then the mishap will take that, wrap things up, and we will be all set.

Mr. PETERSON. I would just end by saying that, again, I appreciate your testimony. It is very unusual for us to bring you forward even before an accident board is complete with their actions on some of these incidents. We appreciate your candor and clear professional expertise as it has been presented here. Thank you.

Admiral JOHNSON. Thank you, sir.

Mr. HUNTER. Gentlemen, thank you very much for being with us.

I might mention that Kenny Harrell, who is a Federal firefighter from San Diego and has been involved in saving some aircraft and some people, is with us today, and Kenny, we appreciate your being present in the National Security Committee.

This is a very somber series of events, admiral, and Admiral Cook and Captain Snodgrass and General Blot. I think most Americans do not realize that operations, day-to-day operations with no conflict, result annually in a number of aircraft going down, and that is a fact of life. Be assured that we want to work closely with you to see to it that that number is kept at an absolute minimum. The one thing this subcommittee can do is to do the right things with respect to funding improvements, safety modifications that will make the aircraft as safe as they can be.

General Blot, on that one note, the one thing that I have taken from this hearing is that the administration, I think, has not been

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responsible in terms of failing to accelerating a program, this remanufacturing program which makes these AV–8B's, a third of which have crashed, about 50 percent more safe. If I am wrong on those statistics, please correct me.

I think that is a dramatic increase in safety that we could achieve and that means a number of lives saved each year in terms of Marine pilots. I think that is one area where we should definitely look at increasing the funds for remanufactured units.

What is in the President's budget this year for remanufactured AV–8B's?

General BLOT. There are 10 aircraft in the budget, sir.

Mr. HUNTER. And you have how many that we have to go through?

General BLOT. We have a total of 72 right now, which would leave 24 unaccounted for.

Mr. HUNTER. In your estimation, in your personal opinion, would you like to see that program accelerated?

General BLOT. Yes, sir; again, though, it comes down into there are only so many funds and they have to be split between a lot of critical programs.

Mr. HUNTER. The committee may be inclined to increase the President's budget somewhat to do that. I think it is outrageous that we are not making those improvements, because that is not just a marginal increase in safety, it is a dramatic increase in safety and it is a function of dollars and cents spent on it.

I know you have a son who is involved in flying those AV–8B's. That is a very, very arduous assignment, General, and we appreciate your service and your son's service.

Gentlemen, thank you for the testimony. I think we have a fairly complete record and you have been professional and you have been very thorough, I think, in your analysis and your research and your investigation. Please let us know, Admiral Johnson, if there are other things that this subcommittee can do to make our aircraft safer and if there is anything we can do to accelerate the programs that we have talked about.

Captain Snodgrass, thank you both for the briefings before we had the hearing and for your testimony here, for your work on this, and Admiral Cook, the same. We appreciate you.

Once again, this is a somber occasion. The people that fly these aircraft to me are very clearly America's finest citizens. They risk a lot more than the rest of us do and it is a very, very dangerous business.

One last thing we would like to do is see to it that we supply aircraft to the U.S. Navy and the Marine Corps at a rate that is a little bit higher than the rate of aircraft being laid off because of parts problems and being retired and aircraft that crash. As I understand our casualty, we are barely making in terms of naval aviation procurement the casualty rate, is that right, Admiral?

Admiral JOHNSON. I will get you the numbers for the record, Mr. Chairman, but I think we have the assets we need to fully man our carrier flight decks and this transition plan that Captain Snodgrass described before with the F/A–18E and F will keep us in good shape, sir.

Mr. HUNTER. Is not your op tempo, though, and your turnaround time for your workups being somewhat accelerated because of op tempo or because of mission requirements?

Admiral JOHNSON. No, sir; not really. In the aggregate, we are still pretty much on an 18-month cycle. There are exceptions, and you highlighted one of them in your opening remarks, but in the main, we are pretty much on an 18-month cycle right now.

Mr. HUNTER. Gentlemen, thank you very much and the hearing is adjourned.

Admiral JOHNSON. Thank you, Mr. Chairman.

General BLOT. Thank you.

[Whereupon, at 1:29 p.m., the subcommittee was adjourned.]

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